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1977 CENSUS OF MANUFACTURES

Geographic Area Series

Arizona

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HISTORY OF THE ECONOMIC CENSUSES

The economic censuses are comprehensive and periodic canvasses of the Nation's industrial and business activities. Taken by the Census Bureau, a part of the U.S. Department of Commerce, the censuses provide a detailed statistical profile of a large segment of the national economy.

The first economic census of the United States was conducted as part of the 1810 decennial census, when inquires on manufacturing were included with the census of population. All other decennial censuses through 1900, except in 1830, contained questions on manufacturing. In 1904 the quinquennial census of manufacturing began. Although some distributive trade data were collected in the decennial census of 1840, the first census of business was taken in 1929. It covered only retail and wholesale trades, but beginning with the second business census in 1933 and in succeeding censuses various services also have been included. The censuses were taken at varying intervals until 1954, when an integrated economic census program was begun covering the retail and wholesale trades, selected service industries, manufactures, and minerals industries. The 1963 Economic Censuses were expanded to include transportation and commercial fisheries. The 1967 Economic Censuses added construction industries, which had first been reported on for 1929 in the decennial census of 1930 and later had been surveyed for 1935 and 1939. Beginning with the 1967 censuses, Congress authorized the economic censuses to be taken at 5-year intervals covering years ending in "2" and "7". The survey of minority-owned businesses was added to the 1972 Economic Censuses. It was first done as a special project to cover 1969. The 1977 Economic Censuses included women-owned businesses, which were first surveyed as a special project for 1972.

USES OF THE ECONOMIC CENSUSES

The economic censuses are the primary source of facts about the structure and functioning of the economy and, therefore, provide information essential for both government and business. The censuses furnish an important part of the framework for such composite measures as the national accounts. In forecasting and planning, they are especially useful in analyzing the national product in terms of the transactions that determine its size and composition. The economic censuses also provide weights and benchmarks for indexes of industrial production, productivity, and price, all of which are essential for understanding current economic developments.

Manufacturers and distributors make widespread use of the economic censuses in establishing measures of their potential markets by areas, kinds of businesses, and kinds of products. Management in various industries and trades get facts from them for use in economic or sales forecasting, analyzing sales performance, laying out sales territories, allocating advertising budgets, and locating plants, warehouses, and stores. Trade organizations use census statistics for insight into changes in the structure of industry. State and local governments use the geographic detail that describes the patterns of economic change in individual communities.

Following every census, reports are purchased by thousands of businesses and other users; likewise, census facts are widely disseminated by trade associations, business journals, and the daily press. Volumes containing census statistics are available in most major public and college libraries.

AUTHORITY AND SCOPE OF THE ECONOMIC CENSUSES

The economic censuses are required by law under title 13 of the United States Code, sections 131, 191, and 224, which directs that they be taken at 5-year intervals. The 1977 Economic Censuses covered manufacturing, mining and quarrying, construction industries, retail trade, wholesale trade, service industries, selected transportation activities, and minority-owned and women-owned businesses. The next economic censuses are scheduled to be taken in 1983 covering the year 1982.

CENSUS OF MANUFACTURES

General

The 1977 Census of Manufactures is the 30th census of manufactures of the United States. For 1977, it was conducted jointly with the censuses of mineral industries, construction industries, retail and wholesale trade, service industries, selected transportation activities, and minority-owned and women-owned businesses.

This report from the 1977 Census of Manufactures is one of a series of 51 area reports, which provide statistics for each State and the District of Columbia. Additional separate reports

will be issued for each of 82 groups of industries and on special subjects such as size of establishment, legal form of organization, capital expenditures, and inventories.

These separate reports will subsequently be issued as portions of the final census volumes. Volume I, Summary Statistics, will show comparative statistics for industries, States, and standard metropolitan statistical areas on the more important measures of the activity of manufacturing establishments—employment payrolls, inventories, capital expenditures, assets, retirements, rental payments, depreciation, value added by manufacture, etc. It will also show selected subjects such as concentration ratios in manufacturing, fuels and electric energy consumed, and water use in manufacturing. Volume II, Industry Statistics, will be a consolidation of reports for the 82 groups of industries showing data on quantity and value of products shipped, materials consumed, and selected industry statistics by (a) geographic area, (b) employment size class of establishments, and (c) degree of primary product class specialization. Volume III, Area Statistics, will be a consolidation of the 51 area reports showing the same information that is included in this report. The Introduction to the final volumes will treat at greater length many of the subjects described in this Introduction. For example, the volume text will discuss the relationship of value added by manufacture to national income by industry of origin, the changes in statistical concepts over the history of the census, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

Scope of Census and Definition of Manufacturing Industries

The 1977 Census of Manufactures covers all establishments primarily engaged in manufacturing as defined in the 1972 Standard Industrial Classification (SIC) Manual.[1] This is the system of industrial classification developed over a period of years by experts on classification in government and private industry under the guidance of the Office of Federal Statistical Policy and Standards, U.S. Department of Commerce. This system of classification is in general use among government agencies as well as organizations outside the government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of inorganic or organic substances into new products. The assembly of component parts of products is also considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills which characteristically use power-driven machines and materials handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salesmen. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for the trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is based on a scientifically selected sample of approximately 70,000 establishments, and it collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply detailed information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services.

Establishment Basis of Reporting

The census of manufactures and the annual survey of manufactures are conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1977, as in earlier years, a minimum size limit was set for including establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than $5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries.

Manufacturing Universe and Census Report Forms

The 1977 Census of Manufactures universe includes approximately 350,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in this publication are described below.

A. Small Single-Unit Companies Not Sent a Report Form

In the 1977 Census of Manufactures, approximately 145,000 small single-establishment companies were excused from filing

[1] **Standard Industrial Classification Manual: 1972.** For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 4101-0066. Price $6.75. **1977 Supplement.** Stock No. 003-005-00176-0. Price 90 cents.

reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative files of the Internal Revenue Service (IRS) and the Social Security Administration (SSA). The cutoffs were selected so that these administrative records cases would account for no more than 3 percent of the value of shipments for the industry. Generally, all single-establishment companies with less than 5 employees were excused while all establishments with more than 20 employees were mailed report forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of the IRS and SSA under special arrangements which safeguarded the confidentiality of both tax and census records. Estimates for data other than payrolls and value of shipments for these small establishments were developed from industry averages.

The industry classification codes included in the administrative records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded to the 4-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity. Sometimes these administrative record cases were given only a 2- or 3-digit SIC code and later coded to those 4-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given 2- or 3-digit industry group. Furthermore, the industry code assigned to an administrative record case when the establishment came into existence is seldom updated to reflect changes in the primary activity for these small establishments.

As a result of these situations, a number of small establishments may have been misclassified as to industry. However, such possible misclassifications have no signficant effect on the statistics other than on the number of establishments. The total establishment count should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

B. Establishments Sent a Report Form

The 205,000 establishments covered in the mail canvass were divided into three groups:

1. ASM sample establishments—This group consisted of approximately 70,000 establishments covering all the units of large manufacturing companies as well as a sample of the medium and smaller companies. The probability of selection was proportionate to size (see Appendix C, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-100) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. Results of the ASM inquiries are included in table 3b of this report.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of this many forms to canvass the approximately 450 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries, as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and in a large number of cases the quantity of the product shipped during the survey year. Space was also provided for the respondent to describe products not specifically indentified on the form.

The report form also contained a materials-consumed inquiry which varied from form to form depending on the industries being canvassed. The respondent was asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and in certain cases the quantity consumed. Once again, space was provided for the respondent to describe significant materials not identified on the form.

Finally, a wide variety of special inquiries was included to measure or investigate activities peculiar to a given industry, such as operations performed and equipment used.

2. Large and medium establishments (non-ASM)—Approximately 85,000 establishments were included in this group. A variable cutoff based on administrative records payroll data and determined on an industry-by-industry basis was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections were the same as those used for the ASM establishments and were consistent with the historical industry classification of the establishments.

3. Small single-unit establishments (non-ASM)—This group consisted of approximately 50,000 establishments. For those industries where application of the variable cutoff for administrative records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the 24 versions of the short form which requested summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures. Use of the short form has no adverse effect on published totals for the industry statistics, as the same data were collected on the short as well as the long forms.

Central Administrative Offices and Auxiliary Units

A central administrative office (CAO) is an establishment whose employees are primarily engaged in general administrative, supervisory, purchasing, accounting, general engineering and systems planning, legal, financial, and related management functions performed centrally for other establishments of the same company. An auxiliary is an establishment whose employees are primarily engaged in performing supporting services for other establishments of the same company (its mines, factories, retail stores, etc.), rather than for the general public or for other business firms. (See Central Administrative Office and Auxiliary Unit Employees in appendix B for more detail.)

In the 1977 census, as in previous censuses, respondents were asked to file separate report forms (NC-X6) for CAO's and auxiliary units which were at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two or more establishments.

This report includes information for separately operated CAO's tabulated from the form NC-X6. Also included are data for those auxiliary operations that are conducted at the same location as the manufacturing operation and operate as an integral part thereof. These data are usually provided on the census of manufactures report form for the operating manufacturing establishment.

A separate report on all separately operated CAO's and auxiliaries, including those serving nonmanufacturing establishments, will be issued separately as part of the Enterprise Statistics program of the 1977 censuses of construction industries, wholesale and retail trade, selected service industries, manufactures, and mineral industries. This report will provide data by industry of the establishment served, by primary activity of the parent company, by size of CAO's, and by size of parent company. Data will be presented on employment by type of activity performed by the employees and primary activity of the CAO. Information will also be shown on capital expenditures, inventories, and cost of research and development.

Industry Classification of Establishments

Each of the establishments covered in the census was classified in one of approximately 450 manufacturing industries in accordance with the industry definitions embodied in the SIC system. Under this system of classification, an industry is generally defined as a group of establishments producing a single product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of plants must be significant in terms of its number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions became progressively narrower with successive additions of numerical digits. There are 20 major groups (2-digit SIC), approximately 150 groups (3-digit SIC), and 450 industries (4-digit SIC). The product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 1,500 classes of products, identified by a 5-digit code, and about 13,000 products, identified by a 7-digit code. The 7-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds in value production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is determined not only by the products it makes but also by the processes employed in making those products. For example, establishments engaged in blast furnace operations, refining of nonferrous metals from ore, or rolling and drawing of nonferrous metals—processes which involve heavy capitalization in specialized equipment—would be classified according to the process used during a census year. These establishments would then be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified as to industry only if the change in the primary activity from the prior year is significant or the change has occurred for two successive years. This procedure prevents reclassification because of only minor shifts in product mix.

In ASM years, small single-unit establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see Appendix C, Annual Survey of Manufactures).

However, in a census year, ASM plants will shift from one industry to another. The result is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior year and current year published totals, particularly at the 4-digit SIC level, should be viewed with caution.

The effect of industry shifts, along with the effects of sampling and processing errors and revisions to establishment data reported by the respondents, is the main reason for the difference between the end-of-year inventory figures included in the 1976 ASM publication and the 1977 beginning-of-year inventory figures from the census shown in table 3a of this report. It is also the main reason for the difference between the end-of-year assets figures shown in the 1976 ASM publication and the 1977 beginning-of-year assets figures shown in table 3b of this report.

As previously noted, the small establishments that may have been misclassified as to industry are usually administrative record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establish-

ments of an industry rarely specialize to this extent. The industry statistics (employment, payroll, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) therefore reflect not only the primary activities of the establishments in that industry but also their secondary activities.

Geographic Area Coding

Accurate and complete information on the physical location of each establishment is required to tabulate the census data for States, standard metropolitan statistical areas (SMSA's), counties, and incorporated municipalities including cities, towns, villages, boroughs, and townships. As in previous censuses, the mailing address of the establishment was not always accepted as defining the physical location. An example of this situation is when the mailing address is a P.O. box or a central office. Respondents were therefore required to report their street address, municipality, county, and State. The reported address was then checked against a preassigned area code as described below.

In censuses prior to 1963, clerks assigned geographic code numbers to each establishment based on the description furnished by the respondent. The process was slow and required careful verification. Beginning with 1963, a computerized system was developed which assigned an area code number and a prefix symbol to the mailing address before the questionnaires were mailed. The assignment of tentative code numbers by the computer was based on extensive reference files which have been continually updated and expanded since 1963. The prefix symbol indicated whether the information contained in the mailing address was sufficient to provide a clearly acceptable area code or whether there was some question about the physical location of the establishment (e.g., about P.O. box cases).

If the prefix symbol indicated any question about the acceptability of the mailing address, the information received from the respondent on the actual location was later carefully reviewed. For nonmail establishments (and those single-unit establishments that did not provide acceptable information on physical location), location information from the Internal Revenue Service tax forms was used as a basis for coding.

Geographic Areas Covered

The State—Total data for each State and the District of Columbia are published in tables 1 through 4. Table 5 contains data for 2-, 3-, and 4-digit SIC industries with 150 manufacturing employees or more, except those whose inclusion would disclose the operations of individual companies.

Standard metropolitan statistical areas (SMSA's)—SMSA's are integrated economic and social units with a large volume of daily travel and communication between the central city and outlying parts of the area.[1] Each area (except in New England) consists of one whole county or more. An area may include highly industrialized counties and adjoining counties, primarily residential in character, that contribute significantly to the SMSA industrial labor force and are socially and economically integrated with the central city. SMSA's are defined by the Federal Committee on Standard Metropolitan Statistical Areas of the Office of Management and Budget for use throughout the Federal Government in presenting economic and social data.

In the New England States, similar criteria are applied in defining SMSA's on a city and town basis because towns rather than counties are the significant political unit in these States.

The requirement that each SMSA consist of county units (except in New England) sometimes results in the inclusion of considerable territory that ordinarily would not be considered "metropolitan," much less "industrial." Metropolitan areas could be defined more accurately by smaller area segments, such as minor civil divisions. However, the usefulness of information based on such areas would be limited by the fact that many types of economic and social data are available only on a county basis.

Each SMSA is identified primarily by the name of the principal city of the area. The area title may include one or two additional city names.

Table 4 shows all manufacturing totals for approximately 280 SMSA's. Table 6 includes industry detail at the 2-, 3-, and 4-digit level for SMSA's with 250 manufacturing employees or more, except those whose inclusion would disclose the operations of individual companies. This continues the practice begun in 1967. Before then, no detail had been shown for SMSA's under 40,000 total employment and no 4-digit industries for SMSA's under 190,000 total employment.

The data for SMSA's which changed definition since the 1972 census have been retabulated on the new basis for 1972 in this report but not for earlier years.

Standard consolidated statistical areas (SCSA's)—Each SCSA includes two or more contiguous SMSA's which meet specific criteria of size, urban character, integration and contiguity of urbanized areas. As with the SMSA's, the SCSA's are defined by the Federal Committee on Standard Metropolitan Statistical Areas of the Office of Management and Budget. Their number has increased from two in the 1972 Census to 13 for 1977. All manufacturing totals are in table 4. Table 6 has data for 2-, 3-, and 4-digit industries with 250 manufacturing employees or more, except those whose inclusion would disclose the operations of individual companies.

Industrial counties or county equivalents—Counties are the primary divisions of States, except in Louisiana where they are called parishes and in Alaska where they are called census divisions. Georgia, Maryland, Missouri, Nevada, and Virginia have one or more cities that are independent of any county organization and constitute primary divisions of their States. These cities

[1] Each SMSA must include either (1) a city with 50,000 or more inhabitants, or (2) a city having a population of at least 25,000 which (a) with the addition of the population of contiguous places has a population density of at least 1,000 persons per square mile; (b) constitutes, for general economic and social purposes, a single community with a combined population of at least 50,000; and (c) includes a total population of at least 75,000 in the county or counties in which the city and contiguous places are located.

are treated as counties. Table 4 presents total data for counties. Table 7 presents data by county for 2-, 3-, and 4-digit industries with 450 manufacturing employees, or more, except data whose inclusion would disclose the operations of individual companies.

Cities with 450 manufacturing employees or more—The term "city" includes boroughs, towns, and villages, except boroughs in Alaska and New York. For census purposes, cities are defined as incorporated municipalities with populations of at least 2,500, or unincorporated municipalities with populations of at least 25,000, based on the 1970 population census. In addition, a few "industrial park" areas of substantial manufacturing activity but with population below the specified limits have been included in the 1977 Census of Manufactures. Table 4 presents total data for cities with 450 manufacturing employees or more. Table 8 presents data by city for 2-, 3-, and 4-digit industries with 450 manufacturing employees or more, except those whose inclusion would disclose operations of individual companies.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the operations of an individual establishment or business. However, the number of establishments classified in a specific industry is not considered a disclosure, so this item may be given even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1-8 of this report is based on the total value of shipments. Whenever the total value of shipments cannot be shown without disclosing information for individual companies, the complete line has been suppressed. However, the suppressed data are included in higher level totals. In suppressing figures to avoid disclosing information about individual companies, States are given precedence over standard metropolitan statistical areas, standard metropolitan statistical areas over counties, and counties over cities. In tables showing industry detail, major industry group (2-digit) totals take precedence over industry group (3-digit) totals which, in turn, take precedence over individual (4-digit) industries.

MICROFICHE AND COMPUTER TAPES

All the data in this report are available on microfiche. The data in tables 3a through 8, except 3b, are also available on computer tape.

In addition to the published data being on computer tape, one major data series, the location of manufacturing plants, will be available only on computer tape. This series presents the number of establishments by employment size class by 4-digit SIC industry codes for States, counties, and places of 2,500 inhabitants or more. These data are available for both State and county by industry and State and place by industry.

Microfiche reports and computer tapes are sold by the Customer Services Branch, Data Users Services Division, Bureau of the Census, Washington, D.C. 20233.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1977 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, D.C. 20233.

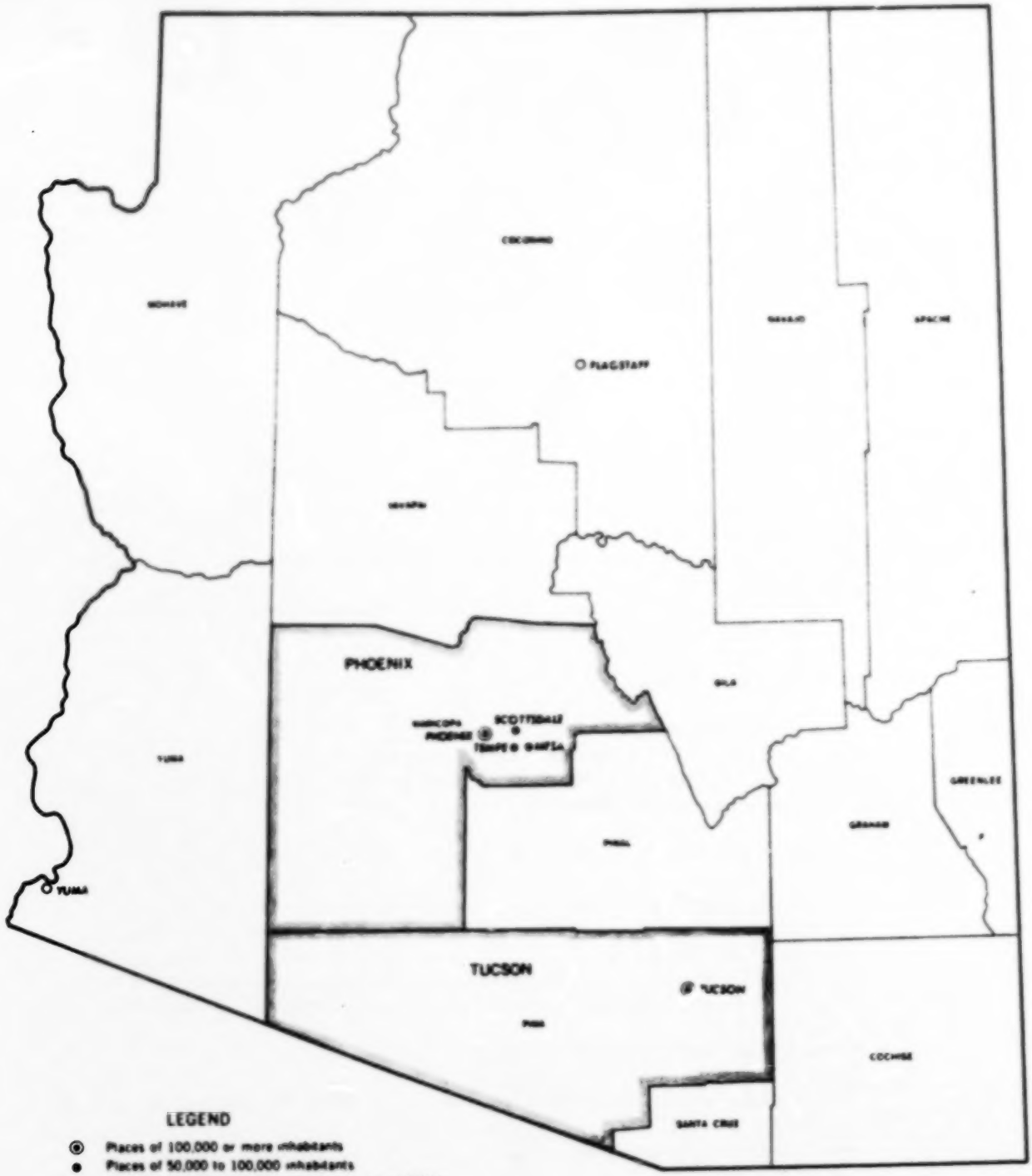
USERS' GUIDE IN LOCATING STATISTICS BY TABLE NUMBER

[For definitions of SCSA's and SMSA's, see appendix A. For explanation of terms, see appendix B]

Item	State statistics				SCSA and SMSA statistics				County statistics		Statistics for selected cities	
	Historical	Operating ratios	All manufacturing totals	By selected industry	Historical (selected SCSA's/ SMSA's)	Operating ratios (selected SCSA's/ SMSA's)	All manufacturing totals	By selected industry	All manufacturing totals	By selected industry	All manufacturing totals	By selected industry
Number of manufacturing establishments:												
Total	2a		[1]3a, 4	5	2a		4	6	4	7	4	8
By employment size class				9						9		
Employment and payroll:												
Number of employees	1, 2a	2b	3a, 4	5	2a	2b	4	6	4	7	4	8
Payroll	1, 2a	2b	3a, 4	5	2a	2b	4	6	4	7	4	8
Supplemental labor costs			[1]3b									
Production workers	2a	2b	[1]3a, 4	5	2a	2b	4	6	4	7	4	8
Production worker hours	2a	2b	[1]3a, 4	5	2a	2b	4	6	4	7	4	8
Production worker wages	2a	2b	3a, 4	5	2a	2b	4	6	4	7	4	8
Shipments, cost of materials, and value added:												
Value of shipments	2a	2b	3a, 4	5	2a	2b	4	6	4	7	4	8
Value added by manufacture	2a	2b	3a, 4	5	2a	2b	4	6	4	7	4	8
Cost of materials	2a	2b	[1]3a, 4	5	2a	2b	4	6	4	7	4	8
Cost of fuels and electric energy			3a									
Inventories:												
Beginning and end of year			3a									
Stage of fabrication			3a									
Expenditures, assets, rents, and purchased services:												
New capital expenditures	2a		[1]3a, [1]3b, 4	5	2a		4	6	4	7	4	8
Used plant and equipment expenditures			3a, [1]3b									
Gross assets			[1]3b									
Depreciation			[1]3b									
Retirements of buildings and machinery			[1]3b									
Rental payments			[1]3b									
Purchased services			[1]3b									

[1] Detailed information shown.

ARIZONA



U.S. Department of Commerce
BUREAU OF THE CENSUS

SUMMARY OF FINDINGS

In 1977, 110.9 thousand persons were employed in Arizona's manufacturing establishments. This figure represented an increase of 18 percent from the 1972 figure of 93.9 thousand workers.

The total value added by manufacture for the State amounted to $3,333 million in 1977, an increase of approximately 77 percent from the 1972 figure of $1,880 million. All dollar figures in this report are in current dollars and are, therefore, not adjusted for changes in price levels.

In the State, the most important industry groups ranked by employment were electric and electronic equipment; machinery, except electrical; transportation equipment; and primary metal industries. They accounted for approximately 52 percent of the State's 1977 employment. These same industry groups were in the forefront for 1972 when they accounted for approximately 52 percent of the State's employment.

The most important counties in the State ranked by employment, were Maricopa, Pima, Pinal, and Gila. They accounted for approximately 90 percent of the State's 1977 manufacturing employment. In 1972, these same counties accounted for approximately 91 percent of the State's employment.

The methods of data collection and use of administrative records are discussed in detail in the Introduction. Small single-unit companies with up to 20 employees (the cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received in time to be tabulated), statistics on payrolls and receipts were obtained from administrative records of other government agencies. Other statistics were developed from industry averages. For this State, these establishments accounted for 5 percent of the total value of shipments.

Table 1. Historical Employment Statistics for Operating Manufacturing Establishments and Central Administrative Offices: 1977 and Earlier Years

(For definitions of SCSA's and SMSA's, see appendix A. For explanation of terms, see appendix B)

State, standard metropolitan statistical area, and year	All establishments		Operating manufacturing establishments		Central administrative offices and auxiliaries[1]	
	Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)
Arizona:						
1977	110.9	1,462.9	105.9	1,374.5	5.0	88.4
1972	93.9	855.1	92.2	830.5	1.7	24.6
1967	76.8	543.2	75.7	533.1	1.1	10.1
1963	56.9	347.5	56.4	342.7	.6	4.8
STANDARD METROPOLITAN STATISTICAL AREAS						
Phoenix:						
1977	84.6	1,135.2	80.1	1,056.9	4.5	80.3
1972	71.9	673.6	70.6	653.0	1.3	19.6
1967	59.3	433.4	58.6	426.1	.7	7.3
1963	40.9	253.1	40.4	249.3	.4	3.8
Tucson:						
1977	11.1	143.6	10.9	141.1	.2	2.5
1972	9.1	90.6	(D)	(D)	(D)	(D)
1967	8.5	59.8	(D)	(D)	(D)	(D)
1963	8.3	50.8	8.2	50.8	-	-

- Represents zero. (D) Withheld to avoid disclosing operations of individual companies.

[1]Defined in appendix B. Data for these establishments are included at the total manufacturing level in each table in this report. Data for these establishments are shown separately in tables 5 and 9 and included in State, SMSA, county, or city totals in other tables.

Table 2a. Historical Statistics for the State and Selected Standard Metropolitan Statistical Areas: 1977 and Earlier Years

(Includes SCSA's and SMSA's with 40,000 manufacturing employees or more. For definitions of SCSA's and SMSA's, see appendix A. For explanation of terms, see appendix B)

Year[1]	Establishments[2]		All employees[2]		Production workers			Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	Comparative indexes and U.S. employment			
														United States	
	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil. hours)	Wages (million dollars)					Percent of U.S. manufacturing employment	Index of State employment change (1977=100)	Index of manufacturing employment change (1977=100)	U.S. manufacturing employment (1,000)
ARIZONA															
1977 CENSUS	2 892	677	110.9	1 462.9	69.8	135.0	780.7	3 332.9	3 773.4	7 022.4	213.7	.97	100	100	19 586.9
1976 ASM	(NA)	(NA)	99.0	1 237.1	62.5	120.1	651.7	2 882.4	3 368.2	6 232.9	183.2	.93	89	96	18 753.0
1975 ASM	(NA)	(NA)	95.4	1 099.8	59.7	112.4	587.3	2 600.7	2 914.5	5 517.0	192.9	.92	76	94	18 362.2
1974 ASM	(NA)	(NA)	108.9	1 146.3	70.7	134.0	604.7	2 787.4	3 113.2	5 742.3	247.1	.95	98	102	19 844.8
1973 ASM	(NA)	(NA)	104.4	1 003.2	68.4	133.0	550.5	2 397.5	2 648.6	4 939.7	219.4	.92	94	102	19 897.9
1972 CENSUS	2 037	597	93.9	895.1	62.3	121.1	481.5	1 879.8	2 233.7	4 041.2	198.6	.99	85	98	19 028.7
1971 ASM	(NA)	(NA)	82.6	721.1	52.4	102.3	387.3	1 584.8	1 775.7	3 180.7	142.2	.95	75	94	18 363.1
1970 ASM	(NA)	(NA)	88.8	713.7	58.7	110.1	376.8	1 636.8	1 797.8	3 175.3	116.5	.96	80	99	19 217.2
1969 ASM	(NA)	(NA)	91.2	696.1	59.2	117.5	375.6	1 575.1	1 663.4	2 922.6	118.4	.96	82	103	20 035.5
1968 ASM	(NA)	(NA)	82.0	601.1	54.6	109.6	330.1	1 129.7	1 267.8	2 019.0	107.2	.92	76	100	19 527.6
1967 CENSUS	1 630	424	76.8	563.2	50.8	101.8	308.6	995.3	1 003.9	2 003.7	109.9	.90	69	99	19 323.2
1966 ASM	(NA)	(NA)	71.0	498.0	47.4	97.7	287.0	926.5	1 077.5	1 980.6	78.5	.87	64	98	19 029.5
1965 ASM	(NA)	(NA)	61.1	427.1	40.7	83.8	234.3	717.9	980.7	1 688.5	52.0	.84	55	92	18 010.2
1964 ASM	(NA)	(NA)	59.8	394.8	39.9	81.3	221.5	654.3	876.6	1 518.8	39.2	.85	56	89	17 268.5
1963 CENSUS	1 518	339	56.9	347.9	38.6	77.5	210.5	627.1	(NA)	(NA)	49.5	.84	51	87	16 958.6
PHOENIX SMSA															
1977 CENSUS	1 976	488	84.6	1 135.2	51.1	99.4	577.2	2 556.6	2 092.8	4 586.6	156.5	.43	100	100	19 586.9
1976 ASM	(NA)	(NA)	70.3	907.3	42.6	81.9	452.3	2 041.8	1 639.6	3 644.4	122.7	.37	83	96	18 753.0
1975 ASM	(NA)	(NA)	68.6	821.4	41.8	77.6	398.1	1 897.8	1 472.5	3 399.8	83.8	.37	81	94	18 362.2
1974 ASM	(NA)	(NA)	80.8	876.0	49.8	96.4	442.9	1 983.0	1 539.5	3 476.5	118.1	.41	95	102	19 844.8
1973 ASM	(NA)	(NA)	80.7	794.6	51.0	99.1	414.1	1 757.1	1 391.7	3 089.6	100.2	.41	95	102	19 897.9
1972 CENSUS	1 367	411	71.9	673.6	44.4	90.4	365.5	1 379.0	1 199.9	2 593.5	81.5	.38	85	98	19 028.7
1971 ASM	(NA)	(NA)	63.7	577.1	39.0	78.9	300.0	1 044.5	935.0	1 999.6	54.4	.35	75	94	18 363.1
1970 ASM	(NA)	(NA)	69.7	575.0	41.6	83.6	290.9	1 012.4	903.9	1 904.2	74.2	.36	82	99	19 217.2
1969 ASM	(NA)	(NA)	72.4	565.0	45.5	90.7	296.1	946.3	927.5	1 872.2	57.6	.36	86	103	20 035.5
1968 ASM	(NA)	(NA)	65.5	488.4	41.9	84.0	254.8	873.7	734.9	1 642.6	68.4	.34	77	100	19 527.6
1967 CENSUS	1 063	296	59.3	433.4	37.0	75.1	228.1	773.3	615.8	1 396.9	89.4	.31	70	99	19 323.2
1966 ASM	(NA)	(NA)	56.3	398.5	36.6	75.5	217.2	719.1	569.7	1 288.0	66.6	.30	67	98	19 029.5
1965 ASM	(NA)	(NA)	48.2	325.7	31.5	64.7	180.8	537.3	479.1	1 015.3	38.6	.27	57	92	18 010.2
1964 ASM	(NA)	(NA)	44.7	288.7	28.4	58.3	159.6	486.7	420.9	893.2	28.6	.26	53	89	17 268.5
1963 CENSUS	975	233	40.9	253.1	26.3	52.9	142.8	435.6	(NA)	(NA)	38.3	.24	48	87	16 958.6

(NA) Not available.

[1]In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1963, see 1963 Census of Manufactures, vol. III, table 1 of State chapter.

[2]Including central administrative offices and auxiliaries (for definition, see appendix B).

[3]Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B).

Table 2b. Selected Operating Ratios for the State and Selected Standard Metropolitan Statistical Areas: 1977 and Earlier Years

(Includes SCSA's and SMSA's with 40,000 manufacturing employees or more. For definitions of SCSA's and SMSA's, see appendix A. For explanation of terms, see appendix B)

Year[1]	Payroll per employee (dollars)	Production worker as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
ARIZONA									
1977 CENSUS	13 195	63	1 935	5,78	54	75	30 062	44	24,66
1976 ASM	12 496	63	1 922	5,43	54	74	29 115	43	24,00
1975 ASM	11 520	63	1 883	5,05	53	73	27 261	42	23,14
1974 ASM	10 526	65	1 895	4,51	54	74	25 596	41	20,80
1973 ASM	9 609	66	1 944	4,14	54	74	22 965	42	18,03
1972 CENSUS	9 106	66	1 944	3,98	55	76	20 017	45	15,52
1971 ASM	8 730	63	1 952	3,79	56	78	16 763	52	13,53
1970 ASM	8 037	62	2 013	3,40	57	79	16 180	50	13,05
1969 ASM	7 633	65	1 985	3,20	57	81	13 981	55	10,89
1968 ASM	7 330	67	2 007	3,01	52	77	13 777	53	10,31
1967 CENSUS	7 073	66	2 004	3,03	50	77	12 960	55	9,78
1966 ASM	7 014	67	2 061	2,94	55	80	13 049	54	9,48
1965 ASM	6 663	67	2 059	2,80	58	82	11 750	57	8,57
1964 ASM	6 268	67	2 038	2,72	58	82	10 981	57	8,05
1963 CENSUS	6 107	68	2 008	2,72	(NA)	(NA)	11 021	55	8,09
PHOENIX SMSA									
1977 CENSUS	13 411	60	1 947	5,81	66	70	30 227	44	23,72
1976 ASM	12 906	61	1 923	5,52	65	70	29 529	44	23,17
1975 ASM	11 974	60	1 893	5,13	63	67	27 665	43	21,46
1974 ASM	10 842	62	1 936	4,59	64	69	24 542	44	20,57
1973 ASM	9 846	63	1 943	4,18	65	71	21 773	45	17,73
1972 CENSUS	9 369	65	1 948	4,04	67	74	19 179	49	15,25
1971 ASM	9 060	61	1 959	3,93	67	74	16 429	55	13,70
1970 ASM	8 350	60	2 010	3,46	67	78	14 525	57	12,11
1969 ASM	7 804	63	1 993	3,24	56	80	13 070	60	10,45
1968 ASM	7 456	64	2 005	3,03	65	76	13 339	56	10,40
1967 CENSUS	7 309	62	2 030	3,04	66	75	17 240	42	10,30
1966 ASM	7 078	65	2 043	2,86	66	78	12 773	55	9,52
1965 ASM	6 757	65	2 059	2,78	67	79	11 147	61	8,30
1964 ASM	6 414	64	2 053	2,74	67	79	10 888	59	8,35
1963 CENSUS	6 188	64	2 011	2,70	(NA)	(NA)	10 650	58	8,23

Note: For qualifications to data, see footnotes on table 2a.
(NA) Not available.

Table 3a. Summary Statistics for the State: 1977 and 1972

[For explanation of terms, see appendix B]

Item	Unit of measure	1977	1972
All establishments[1]	number	2 992	2 037
With 1 to 19 employees	do	2 215	1 440
With 20 to 99 employees	do	506	450
With 100 employees or more	do	172	147
All employees, average for year[1]	1,000	110 9	93 9
Payroll for year, all employees[1]	mil dollars	1 462 9	855 1
Production workers:			
Average for year	1,000	89 8	82 3
March	do	87 5	80 6
May	do	89 4	81 9
August	do	70 1	82 2
November	do	71 7	84 4
Hours	millions	135 0	121 1
January to March	do	32 5	29 8
April to June	do	34 0	30 3
July to September	do	33 7	29 7
October to December	do	34 9	31 5
Wages	mil dollars	780 7	481 5
Cost of materials, etc.[2]	do	3 773 4	2 233 7
Materials, parts, containers, etc., consumed	do	3 248 9	2 004 4
Resales	do	173 0	82 9
Fuels consumed	do	72 8	25 3
Purchased electric energy	do	78 8	30 8
Contract work	do	197 9	90 6
Value of shipments, including resales[2]	do	7 022 4	4 041 2
Value of resales	do	201 0	101 8
Value added by manufacture	do	3 332 9	1 879 6
Manufacturers' inventories:			
Beginning of year	do	1 026 0	489 3
Finished products	do	277 4	163 5
Work in process	do	491 9	227 0
Materials, supplies, fuel, etc	do	256 7	108 8
End of year	do	1 145 6	580 3
Finished products	do	348 8	199 6
Work in process	do	507 4	258 9
Materials, supplies, fuel, etc	do	291 3	123 8
Capital expenditures for plant and equipment	do	228 0	203 8
New capital expenditures	do	213 7	198 4
New buildings and other structures	do	33 4	42 7
New machinery and equipment	do	180 3	155 7
Used capital expenditures	do	14 2	5 4

- Represents zero (D) Withheld to avoid disclosing operations of individual companies

[1]Including central administrative offices and auxiliaries (for definition, see appendix B)

[2]Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B)

Table 3b. Supplemental State Statistics Based on Sample Estimates: 1977

(For explanation of terms, see appendix B. For description of annual survey of manufactures (ASM), see appendix C)

Item	Amount (million dollars)	Standard error of estimate (percent)
Gross value of depreciable assets:		
Total:		
Beginning of year	2,219.4	1
New capital expenditures	207.9	3
Used capital expenditures	16.9	20
Retirements	78.6	4
End of year	2,365.5	1
Buildings and other structures:		
Beginning of year	562.2	2
New capital expenditures	35.6	17
Used capital expenditures	1.5	46
Retirements	10.0	6
End of year	589.4	2
Machinery and equipment:		
Beginning of year	1,657.3	1
New capital expenditures	172.2	12
Automobiles, trucks, etc., for highway use	29.7	(NA)
Computers and peripheral data processing equip.	12.0	(NA)
All other	(S)	(NA)
New machinery and equipment, n.s.k.	(S)	(NA)
Used capital expenditures	(15.4)	22
Retirements	68.6	5
End of year	1,776.3	1
Rental payments:		
Total	39.9	5
Buildings and other structures	19.8	7
Machinery and equipment	20.1	6
Depreciation charges during 1977:		
Total	153.3	2
Buildings and other structures	23.4	2
Machinery and equipment	130.0	2
Supplemental labor costs:		
Total	267.9	1
Legal costs	108.2	1
Voluntary costs	159.7	1
Purchased services:		
Cost of purchased services for the repair of--		
Buildings and other structures	(60.5)	20
Response coverage ratio (percent)	63	(X)
Machinery	(57.5)	46
Response coverage ratio (percent)	61	(X)
Cost of purchased communication services	(S)	(X)
Response coverage ratio (percent)	67	(X)

Note: Expenditures data, shown in tables 2a, 3a, and 4-8, are census universe figures and may differ from ASM sample estimates shown in this table. Table 3b figures represent best estimate of year-to-year change as measured by continuing ASM sample, but are subject to sampling errors. Hence, as estimates of level, they are not as reliable as universe figures.

Figures in parentheses have standard errors of 15 percent or more. (NA) Not available. n.s.k. Not specified by kind. (S) Withheld because estimate did not meet publication standards. (X) Not applicable.

Table 4. All Manufacturing Statistics for the State, Standard Metropolitan Statistical Areas, Counties, and Selected Cities: 1977 and 1972

[Includes cities with 450 manufacturing employees or more. For definitions of SCSA's and SMSA's, see appendix A. For explanation of terms, see appendix B]

Geographic area	1977											1972	
		All establishments[2]		All employees[2]		Production workers							
	E[1]	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	All employees[2] (1,000)	Value added by manufacture (million dollars)
Arizona	-	**2 892**	**677**	**110.9**	**1 462.8**	**88.8**	**136.0**	**788.7**	**3 282.9**	**3 773.4**	**7 922.4**	**213.7**	**98.9**	**1 679.8**
STANDARD METROPOLITAN STATISTICAL AREAS													
Phoenix	-	1 976	488	84.6	1 135.2	51.1	99.4	577.2	2 558.6	2 082.8	4 588.6	156.5	71.9	1 379.0
Tucson	-	406	77	11.1	143.6	6.6	12.8	72.2	332.7	333.6	684.9	17.8	9.1	156.7
COUNTIES														
Apache	-	21	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Cochise	-	47	14	1.7	19.1	1.3	2.4	13.4	56.2	140.4	199.2	2.0	(D)	(D)
Coconino	-	70	14	1.8	20.2	1.3	2.6	12.9	53.3	73.0	124.1	4.1	1.5	24.5
Gila	-	26	9	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.7	58.3
Graham	E4	13	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.2	2.2
Greenlee	-	5	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Maricopa	-	1 976	488	84.6	1 135.2	51.1	99.4	577.2	2 558.6	2 082.8	4 588.6	156.5	71.9	1 379.0
Mohave	-	69	11	1.7	21.0	1.3	2.4	13.0	34.1	34.3	68.0	(D)	0.8	14.6
Navajo	-	58	11	1.7	21.5	1.4	2.8	17.3	50.5	82.9	131.3	3.0	1.1	21.8
Pima	-	406	77	11.1	143.6	6.6	12.8	72.2	332.7	333.6	684.9	17.8	9.1	156.7
Pinal	-	55	18	2.5	33.1	2.0	4.0	23.6	88.1	484.8	536.2	2.2	2.3	134.1
Santa Cruz	-	15	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Yavapai	-	70	12	1.5	18.4	1.2	2.2	11.3	53.9	37.1	90.8	1.7	1.1	20.6
Yuma	E2	62	11	1.1	10.0	0.9	1.8	8.7	17.2	27.3	43.9	(D)	1.2	13.5
CITIES														
Buckeye	-	6	3	0.5	3.5	0.4	0.7	2.6	6.6	7.7	14.3	(D)	(NA)	(NA)
Casa Grande	-	16	7	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Chandler	-	38	15	1.6	18.1	1.2	2.5	11.5	60.2	83.5	144.6	5.7	(D)	(D)
Douglas	-	20	10	1.3	13.6	1.0	1.8	9.7	46.2	118.0	164.6	1.4	(D)	(D)
Flagstaff	-	55	11	1.3	15.0	1.0	1.8	9.2	42.7	60.9	101.7	(D)	1.0	18.7
Glendale	E1	86	18	3.2	29.0	1.8	3.1	12.8	51.5	57.8	109.8	1.5	2.0	28.2
Mesa	-	101	15	4.2	46.0	2.3	4.2	18.8	117.5	56.2	174.4	9.0	5.7	62.8
Phoenix	-	1 264	332	58.2	814.7	35.1	69.2	423.6	1 923.4	1 470.8	3 334.2	111.5	52.2	1 063.7
Prescott	-	31	8	1.1	10.6	0.8	1.5	6.8	23.3	20.5	42.8	0.4	0.6	8.2
Scottsdale	-	113	16	5.6	77.9	2.3	4.3	23.8	125.4	52.6	172.1	0.8	3.4	66.8
Tempe	E1	201	47	4.5	51.7	3.2	6.3	30.8	100.8	95.1	191.0	8.2	2.7	37.9
Tucson	-	303	57	9.6	125.5	5.6	10.7	60.0	287.1	237.4	560.8	12.7	7.5	125.0
Yuma	E2	45	9	0.9	8.9	0.8	1.5	6.1	14.6	23.7	37.8	(D)	1.1	11.8

- Represents zero. (D) Withheld to avoid disclosing operations of individual companies. (NA) Not available. (Z) Less than 50 thousand dollars or hours, under 50 employees.

[1]Payroll and sales data for small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the balance of items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 to 99 percent; E0—100 percent.

[2]Including central administrative offices and auxiliaries (for definition, see appendix B).

[3]Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B).

Table 5. Statistics by Selected Industry Group and Industry for the State: 1977 and 1972

[Includes industry groups and industries with 150 employees or more. For explanation of terms, see appendix B]

SIC code	Industry	1977											1972	
			All establishments		All employees		Production workers							
		E[1]	Total (no.)	With 20 employees or more (no.)	Number[2] (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	All employees[2] (1,000)	Value added by manufacture (million dollars)
	All industries	-	**2 892**	**677**	**110.9**	**1 462.8**	**88.8**	**136.0**	**788.7**	**3 282.9**	**3 773.4**	**7 922.4**	**213.7**	**98.9**	**1 679.8**
20	**Food and kindred products**	-	**194**	**64**	**6.8**	**74.8**	**3.8**	**7.7**	**43.2**	**188.8**	**898.7**	**788.8**	**14.0**	**6.7**	**134.7**
201	Meat products	-	29	10	1.1	14.9	0.8	1.6	11.0	21.7	220.8	248.3	1.8	1.3	27.3
2011	Meat packing plants	-	22	9	1.0	14.4	0.8	1.5	10.8	18.7	213.8	236.3	1.8	1.2	25.3
202	Dairy products	-	18	9	0.9	11.6	0.4	0.8	5.2	28.1	112.3	140.1	1.8	1.0	23.8
2026	Fluid milk	-	9	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.8	22.7
203	Preserved fruits and vegetables	E2	21	7	0.6	4.9	0.5	0.9	3.5	13.5	18.7	32.2	0.9	88	(D)
2032	Canned specialties	-	9	3	0.4	3.3	0.3	0.6	2.4	10.2	12.7	22.9	0.6	88	(D)

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1977 and 1972—Con.

[Includes industry groups and industries with 150 employees or more. For explanation of terms, see appendix B]

SIC code	Industry	1977												1972	
			All establishments		All employees		Production workers								
		E[1]	Total (no.)	With 20 employees or more (no.)	Number[2] (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	All employees[2] (1,000)	Value added by manufacture (million dollars)
20	**Food and kindred products—Con.**														
204	Grain mill products	-	19	5	0.4	6.6	0.3	0.6	3.4	21.9	61.8	83.6	0.9	0.3	6.1
2047	Dog, cat, and other pet food	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2048	Prepared feeds, n.e.c.	-	15	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
205	Bakery products	E1	27	8	1.1	14.5	0.8	1.2	8.2	29.1	25.5	54.6	2.8	1.2	22.8
2051	Bread, cake, and related products	-	26	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
206	Sugar and confectionery products	-	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2063	Beet sugar	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
207	Fats and oils	-	11	5	0.4	4.1	0.4	0.9	3.2	16.3	54.2	70.4	0.5	BB	(D)
2074	Cottonseed oil mills	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
208	Beverages	-	26	15	1.0	12.4	0.4	1.0	4.2	45.2	71.5	119.5	4.5	1.4	26.0
2086	Bottled and canned soft drinks	-	22	13	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.2	21.7
209	Miscellaneous foods and kindred products	E6	39	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.6	8.8
2099	Food preparations, n.e.c.	E7	26	3	0.2	2.0	0.2	0.3	1.2	6.1	7.3	13.4	0.2	0.4	5.8
23	**Apparel and other textile products**	-	117	39	5.8	36.4	5.1	8.9	27.9	75.8	66.8	138.8	(D)	5.8	64.8
232	Men's and boys' furnishings	-	15	12	2.4	13.5	2.2	3.7	11.0	37.2	35.0	72.3	(D)	2.8	22.4
2321	Men's and boys' shirts and nightwear	-	6	6	0.7	3.9	0.8	1.2	3.4	7.2	11.5	18.5	(D)	BB	(D)
2322	Men's and boys' underwear	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
2327	Men's and boys' separate trousers	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
2328	Men's and boys' work clothing	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2329	Men's and boys' clothing, n.e.c.	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
233	Women's and misses' outerwear	E2	14	11	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.6	5.1
2331	Women's and misses' blouses and waists	-	5	5	0.6	4.0	0.6	1.0	2.5	5.5	2.0	7.5	(Z)	BB	(D)
2336	Women's and misses' dresses	E8	24	3	0.3	2.0	0.3	0.5	1.5	3.9	2.6	6.2	(D)	(NA)	(NA)
234	Women's and children's undergarments	-	6	5	1.1	7.1	1.0	1.8	6.0	12.8	9.9	22.1	(D)	CC	(D)
2341	Women's and children's underwear	-	6	5	1.1	7.1	1.0	1.8	6.0	12.8	9.9	22.1	(D)	CC	(D)
238	Miscellaneous apparel and accessories	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2387	Apparel belts	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
239	Miscellaneous fabricated textile products	E1	57	9	0.7	5.2	0.6	1.0	3.5	9.8	10.6	19.9	(D)	0.7	4.8
2391	Curtains and draperies	E2	30	4	0.3	1.8	0.2	0.4	1.2	2.9	3.6	6.5	(D)	0.4	3.0
2393	Textile bags	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
24	**Lumber and wood products**	-	211	80	6.5	58.1	4.9	9.1	43.4	184.3	183.4	362.8	7.1	5.9	67.4
2411	Logging camps and logging contractors	E1	47	5	0.3	3.1	0.3	0.4	2.7	7.7	8.8	16.2	1.0	0.3	4.7
242	Sawmills and planing mills	-	23	15	2.0	20.1	1.8	3.6	17.5	39.0	63.0	99.1	4.0	1.5	24.2
2421	Sawmills and planing mills, general	-	21	15	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.4	24.1
243	Millwork, plywood, and structural members	-	80	23	1.7	17.6	1.5	2.8	13.3	27.6	52.9	79.5	1.0	1.8	23.7
2431	Millwork	-	35	9	0.6	6.7	0.5	1.0	4.7	13.8	30.4	43.8	0.4	0.8	13.6
2434	Wood kitchen cabinets	-	43	10	0.8	7.9	0.7	1.4	6.0	8.1	12.8	21.8	0.3	0.6	6.2
2439	Structural wood members, n.e.c.	-	12	4	0.3	3.1	0.2	0.4	2.8	4.7	9.7	14.2	0.3	0.3	3.9
245	Wood buildings and mobile homes	E1	21	13	1.3	13.0	1.0	2.0	8.9	26.9	55.7	81.6	0.9	1.0	11.5
2451	Mobile homes	-	12	10	1.0	9.9	0.8	1.8	7.0	19.9	40.3	58.6	(D)	CC	(D)
2452	Prefabricated wood buildings	E8	9	3	0.3	3.1	0.2	0.4	1.8	7.0	15.5	22.0	(D)	(NA)	(NA)
25	**Furniture and fixtures**	E3	100	21	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F.S	1.4	16.8
251	Household furniture	E4	73	16	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.1	11.4
2511	Wood household furniture	E8	36	5	0.3	2.1	0.2	0.5	1.6	3.5	3.5	7.0	0.1	0.5	4.4
2512	Upholstered household furniture	E1	12	7	0.3	2.5	0.2	0.4	1.8	4.3	5.0	9.3	0.1	BB	(D)
2515	Mattresses and bedsprings	E3	19	3	0.2	1.9	0.1	0.2	1.1	5.1	5.9	11.0	0.1	0.3	3.9
254	Partitions and fixtures	E1	19	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.2	3.8
2541	Wood partitions and fixtures	E1	19	2	0.2	2.0	0.1	0.3	1.3	3.8	2.8	6.3	0.1	0.2	3.9

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1977 and 1972—Con.

[Includes industry groups and industries with 150 employees or more. For explanation of terms, see appendix B]

SIC code	Industry	1977												1972	
			All establishments		All employees		Production workers								
		E[1]	Total (no.)	With 20 employees or more (no.)	Number[2] (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	All employees[2] (1,000)	Value added by manufacture (million dollars)
26	Paper and allied products	-	29	19	1.2	16.3	0.9	1.8	13.1	47.8	74.6	121.9	(D)	0.9	21.2
2631	Paperboard mills	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
264	Miscellaneous converted paper products	-	16	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
265	Paperboard containers and boxes	-	11	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2653	Corrugated and solid fiber boxes	-	6	3	0.2	3.2	0.2	0.3	1.9	8.6	12.8	21.4	0.2	AA	(D)
27	Printing and publishing	E1	476	66	7.8	87.2	4.1	7.9	48.7	191.2	98.3	288.7	8.7	6.4	115.6
2711	Newspapers	-	67	20	3.9	44.4	1.4	2.5	17.8	106.3	39.0	145.3	2.8	3.5	70.7
273	Books	E2	19	2	0.2	2.1	0.1	0.2	1.0	5.6	2.5	8.1	0.2	(NA)	(NA)
2741	Miscellaneous publishing	E1	24	3	0.2	2.0	0.1	0.1	0.4	4.8	2.5	7.3	0.1	(NA)	(NA)
275	Commercial printing	E2	290	24	2.0	24.3	1.5	2.8	18.6	46.5	34.2	79.5	2.7	1.8	27.8
2751	Commercial printing, letterpress	E4	171	12	0.8	7.7	0.6	1.1	5.4	14.8	9.8	24.0	0.9	0.6	8.4
2752	Commercial printing, lithographic	E1	113	12	1.2	16.3	0.9	1.8	11.0	30.4	24.4	54.7	1.8	1.2	19.1
2761	Manifold business forms	E1	13	4	0.3	4.4	0.2	0.5	2.8	8.3	10.2	18.1	1.1	0.2	3.2
278	Blankbooks and bookbinding	-	14	8	0.6	5.2	0.5	1.0	4.0	10.4	7.3	17.5	1.4	BB	(D)
2782	Blankbooks and looseleaf binders	-	8	5	0.5	4.0	0.4	0.7	3.0	8.6	6.9	15.4	(D)	BB	(D)
279	Printing trade services	E1	30	5	0.3	3.4	0.2	0.4	2.5	6.5	1.5	8.0	0.3	0.3	4.1
2791	Typesetting	E2	17	3	0.2	1.7	0.1	0.2	1.3	3.1	0.4	3.6	0.2	0.2	2.5
28	Chemicals and allied products	-	82	17	2.2	26.0	1.6	2.9	15.6	167.4	116.4	286.6	7.6	1.7	66.9
281	Industrial inorganic chemicals	-	13	5	0.2	3.5	0.1	0.2	2.2	13.5	10.0	22.2	3.2	0.2	2.9
283	Drugs	-	9	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2834	Pharmaceutical preparations	-	5	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
284	Soaps, cleaners, and toilet goods	-	12	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
2844	Toilet preparations	-	4	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
287	Agricultural chemicals	-	17	4	0.2	3.2	0.1	0.3	1.7	15.3	30.3	46.3	1.8	0.2	6.0
289	Miscellaneous chemical products	E1	22	3	0.5	5.4	0.4	0.7	3.3	12.2	23.2	35.5	0.8	1.4	7.4
2892	Explosives	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
29	Petroleum and coal products	-	14	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
295	Paving and roofing materials	-	13	3	0.2	2.9	0.1	0.2	1.2	11.7	26.4	38.1	0.8	AA	(D)
2951	Paving mixtures and blocks	-	10	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
30	Rubber and miscellaneous plastics products	E2	100	19	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.7	23.7
3041	Rubber and plastics hose and belting	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3069	Fabricated rubber products, n.e.c.	E1	6	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3079	Miscellaneous plastics products	E2	92	16	1.5	15.8	1.1	2.2	9.7	35.5	38.8	73.9	5.0	1.4	20.4
31	Leather and leather products	-	27	6	0.8	4.9	0.5	1.0	3.1	12.9	19.6	32.4	(D)	AA	(D)
3161	Luggage	-	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
317	Handbags and oth. personal leather goods	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3172	Personal leather goods	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
32	Stone, clay, and glass products	-	264	51	4.4	66.1	3.3	6.7	48.8	174.9	157.8	314.4	35.7	4.5	186.8
3241	Cement, hydraulic	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
325	Structural clay products	-	6	3	0.3	2.9	0.2	0.4	2.1	3.9	4.6	8.8	0.3	0.2	1.3
327	Concrete, gypsum, and plaster products	-	136	43	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	3.8	82.5
3271	Concrete block and brick	E1	20	9	0.5	5.8	0.3	0.7	3.4	13.2	16.9	29.7	(D)	0.8	15.8
3272	Concrete products, n.e.c.	-	44	9	0.8	12.3	0.6	1.3	8.7	28.5	15.6	41.7	2.8	0.9	18.0
3273	Ready-mixed concrete	-	66	25	2.0	30.0	1.4	2.8	21.5	77.9	63.1	141.2	10.7	1.9	44.0

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1977 and 1972—Con.

[Includes industry groups and industries with 150 employees or more. For explanation of terms, see appendix B]

SIC code	Industry	1977												1972	
			All establishments		All employees		Production workers								
		E[1]	Total (no.)	With 20 employees or more (no.)	Number[2] (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	All employees[2] (1,000)	Value added by manufacture (million dollars)
33	Primary metal industries	-	64	36	8.2	127.8	6.5	12.4	94.7	316.4	1 263.8	1 595.3	32.2	7.6	306.9
331	Blast furnace and basic steel products	-	7	2	5.8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3312	Blast furnaces and steel mills	-	5	2	5.8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
332	Iron and steel foundries	-	7	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
3325	Steel foundries, n.e.c.	-	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
333	Primary nonferrous metals	-	10	10	3.7	58.3	3.0	5.8	45.1	136.7	982.4	1 053.5	20.9	3.4	182.3
3331	Primary copper	-	9	9	3.7	58.0	3.0	5.7	45.0	136.7	982.4	1 053.5	(D)	3.4	182.3
335	Nonferrous rolling and drawing	-	17	13	2.9	47.6	2.3	4.2	34.5	126.8	256.2	383.3	(D)	3.2	112.7
3354	Aluminum extruded products	-	4	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
3357	Nonferrous wire drawing and insulating	-	9	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
336	Nonferrous foundries	-	8	3	0.2	2.0	0.2	0.3	1.6	2.2	2.9	5.0	0.1	0.2	2.8
339	Miscellaneous primary metal products	E1	9	3	0.2	1.9	0.1	0.2	1.3	3.5	1.7	5.1	0.3	(NA)	(NA)
34	Fabricated metal products	E1	201	62	5.2	66.0	4.0	7.9	46.5	114.4	121.2	232.5	7.9	4.8	67.8
342	Cutlery, hand tools, and hardware	E7	6	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
344	Fabricated structural metal products	E1	139	37	3.3	39.6	2.4	4.7	26.6	69.1	67.4	156.0	5.4	2.7	44.7
3441	Fabricated structural metal	-	18	5	0.4	4.8	0.3	0.6	3.5	8.5	10.5	21.0	1.7	1.2	24.2
3442	Metal doors, sash, and trim	E5	16	4	0.2	2.5	0.2	0.3	1.5	4.9	5.1	10.1	0.4	(NA)	(NA)
3443	Fabricated plate work (boiler shops)	E1	13	7	1.2	15.6	0.8	1.5	10.2	22.2	29.0	50.6	(D)	0.3	3.4
3444	Sheet metal work	E2	64	13	0.8	8.7	0.6	1.4	5.7	17.2	19.5	36.7	0.8	0.7	10.9
3446	Architectural metal work	E1	30	2	0.3	3.7	0.3	0.5	2.6	8.3	4.8	13.2	(D)	0.2	2.0
3448	Prefabricated metal buildings	-	4	3	0.2	2.8	0.2	0.3	1.9	5.8	11.1	15.4	0.1	(NA)	(NA)
345	Screw machine products, bolts, etc.	E4	9	4	0.3	2.8	0.2	0.4	1.9	6.4	3.3	9.5	0.9	AA	(D)
346	Metal forgings and stampings	E1	15	5	0.4	4.0	0.3	0.7	3.1	9.0	5.8	14.4	0.1	(NA)	(NA)
3469	Metal stampings, n.e.c.	E1	15	5	0.4	4.0	0.3	0.7	3.1	9.0	5.8	14.4	0.1	(NA)	(NA)
347	Metal services, n.e.c.	E1	32	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.3	3.5
3471	Plating and polishing	-	20	6	0.4	3.7	0.4	0.7	2.7	7.2	2.8	10.0	0.7	0.3	3.3
349	Miscellaneous fabricated metal products	E2	43	6	0.4	4.5	0.3	0.6	3.0	8.6	10.4	18.5	0.4	0.3	4.7
3489	Fabricated metal products, n.e.c.	E1	27	2	0.2	1.8	0.1	0.2	1.1	3.6	4.7	7.8	0.1	(NA)	(NA)
35	Machinery, except electrical	-	389	77	14.9	201.1	8.5	16.7	92.8	731.8	269.7	993.9	38.6	16.1	269.1
352	Farm and garden machinery	-	16	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3523	Farm machinery and equipment	-	16	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
353	Construction and related machinery	E1	18	4	0.3	4.5	0.2	0.4	3.1	11.7	6.1	19.7	0.3	AA	(D)
354	Metalworking machinery	E1	58	8	1.4	16.7	1.2	2.2	13.1	30.1	18.6	47.8	(D)	0.5	4.4
3544	Special dies, tools, jigs, and fixtures	E5	37	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3546	Power driven hand tools	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
355	Special industry machinery	E1	19	6	0.3	4.0	0.2	0.4	2.5	6.5	6.4	12.9	0.4	CC	(D)
3559	Special industry machinery, n.e.c.	E3	12	3	0.2	2.2	0.1	0.2	1.4	3.1	3.1	6.1	0.1	(NA)	(NA)
356	General industrial machinery	E1	23	6	0.4	4.8	0.3	0.6	2.9	12.5	9.4	21.5	0.9	0.2	2.2
357	Office and computing machines	-	20	9	7.6	122.5	3.5	6.9	37.5	591.1	109.7	695.9	22.9	FF	(D)
3573	Electronic computing equipment	-	19	9	7.6	122.5	3.5	6.9	37.5	591.1	109.7	695.9	22.9	FF	(D)
358	Refrigeration and service machinery	-	30	8	1.4	12.9	1.0	1.9	8.8	19.9	26.9	46.1	1.8	EE	(D)
3585	Refrigeration and heating equipment	-	11	4	1.2	11.6	0.9	1.8	8.1	17.2	25.8	42.4	(D)	EE	(D)
359	Miscellaneous machinery, except electrical	E1	197	31	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.0	26.2
3599	Machinery, except electrical, n.e.c.	E1	195	30	2.4	31.8	1.9	3.8	22.3	80.6	18.8	99.8	4.1	2.0	26.2

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1977 and 1972—Con.

[Includes industry groups and industries with 150 employees or more. For explanation of terms, see appendix B]

SIC code	Industry	1977												1972	
			All establishments		All employees		Production workers							All employees[2]	
		E[1]	Total (no.)	With 20 employees or more (no.)	Number[2] (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[3] (million dollars)	Value of shipments[3] (million dollars)	New capital expenditures (million dollars)	(1,000)	Value added by manufacture (million dollars)
36	Electric and electronic equipment	-	186	80	34.1	369.3	12.5	23.8	133.9	648.2	273.4	886.2	41.8	22.7	331.8
362	Electrical industrial apparatus	-	5	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3621	Motors and generators	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3622	Industrial controls	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
365	Radio and TV receiving equipment	E1	15	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.7	7.3
3651	Radio and TV receiving sets	E1	7	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
366	Communication equipment	-	27	12	5.9	90.9	2.5	4.7	32.3	150.8	57.8	201.3	(D)	FF	(D)
3662	Radio and TV communication equipment	-	24	11	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
367	Electronic components and accessories	-	74	28	16.3	198.9	8.5	15.9	77.5	364.5	179.0	523.6	33.1	16.2	218.1
3674	Semiconductors and related devices	-	16	9	14.3	187.9	7.0	13.0	66.1	312.7	156.8	480.6	30.9	FF	(D)
3675	Electronic capacitors	E1	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
3678	Electronic connectors	E1	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3679	Electronic components, n.e.c.	E2	48	13	1.4	14.5	1.0	2.1	8.0	28.5	13.8	41.7	(D)	CC	(D)
369	Miscellaneous electrical equipment and supplies	E2	17	3	0.2	2.7	0.2	0.3	1.3	8.8	3.9	12.3	0.5	(NA)	(NA)
37	Transportation equipment	-	108	29	16.9	199.7	7.8	16.2	131.3	388.9	364.7	769.6	(D)	8.7	178.8
371	Motor vehicles and equipment	E3	34	4	0.3	3.1	0.3	0.6	2.5	6.2	7.4	13.8	(D)	0.3	4.4
3714	Motor vehicle parts and accessories	E3	23	3	0.3	2.5	0.3	0.5	2.0	4.8	5.0	9.5	(D)	0.2	2.9
372	Aircraft and parts	-	20	9	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3724	Aircraft engines and engine parts	-	9	5	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3728	Aircraft equipment, n.e.c.	E1	10	3	0.2	2.5	0.1	0.2	1.3	5.1	3.8	9.4	0.2	FF	(D)
373	Ship and boat building and repairing	-	15	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3732	Boat building and repairing	-	15	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
376	Guided missiles, space vehicles, parts	-	5	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3761	Guided missiles and space vehicles	-	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3764	Space propulsion units and parts	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3769	Space vehicle equipment, n.e.c.	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
379	Miscellaneous transportation equipment	E2	21	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3792	Travel trailers and campers	E2	19	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
38	Instruments and related products	-	76	13	4.7	66.4	2.1	4.3	22.6	141.3	73.3	208.9	9.3	3.1	66.9
3811	Engineering and scientific instruments	-	10	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
382	Measuring and controlling devices	E1	19	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.2	5.5
3823	Process control instruments	-	6	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
384	Medical instruments and supplies	-	24	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3842	Surgical appliances and supplies	-	10	3	0.3	2.4	0.2	0.3	1.2	14.1	13.3	27.7	0.1	(NA)	(NA)
39	Miscellaneous manufacturing industries	E1	210	56	2.3	33.6	1.9	3.6	16.3	66.6	66.5	167.1	(D)	1.5	29.2
391	Jewelry, silverware, and plated ware	E1	59	5	0.4	3.1	0.3	0.5	1.8	5.5	19.8	25.2	(D)	(NA)	(NA)
3911	Jewelry, precious metal	E2	44	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3931	Musical instruments	-	7	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
394	Toys and sporting goods	-	21	5	0.8	9.1	0.7	1.4	6.6	22.4	20.9	43.3	(D)	0.4	6.9
3949	Sporting and athletic goods, n.e.c.	-	16	3	0.7	7.9	0.6	1.2	5.7	20.2	17.3	37.5	1.7	BB	(D)
399	Miscellaneous manufactures	E2	100	11	0.8	8.3	0.6	1.1	5.2	16.6	11.8	28.2	(D)	0.5	7.9
3993	Signs and advertising displays	E2	36	7	0.4	4.0	0.3	0.5	2.5	8.7	4.4	11.1	(D)	BB	(D)
3999	Manufacturing industries, n.e.c.	E2	59	4	0.4	3.9	0.3	0.5	2.4	8.9	6.7	15.4	0.3	AA	(D)
–	Administrative and auxiliary	-	82	32	5.8	68.4	-	-	-	-	-	-	-	(NA)	(NA)

Note: "All industries" level includes data on number of establishments, total employment, and total payroll for central administrative offices and auxiliaries (for definition, see appendix B).
- Represents zero. (D) Withheld to avoid disclosing operations of individual companies. (NA) Not available. (Z) Less than 50 thousand dollars or hours; under 50 employees.

[1]Payroll and sales data for small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the balance of items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those industry groups and industries where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 to 99 percent; E0—100 percent.

Statistics for some industry groups and industries are withheld to avoid disclosing figures for individual companies. However, for such industry groups and industries with 100 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—100 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; DD—1,000 to 2,499 employees; FF—2,500 employees or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in the group.

[2]Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B).

Table 6. Statistics by Selected Industry Group and Industry for Standard Metropolitan Statistical Areas: 1977 and 1972

[Includes industry groups and industries with 250 employees or more within SCSA's and SMSA's, except those that would disclose operations of individual companies. For definitions of SCSA's and SMSA's, see appendix A. For explanation of terms, see appendix B]

SIC code	SMSA and industry	1977											1972	
			All establishments		All employees		Production workers							
		E[1]	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[2] (million dollars)	Value of shipments[2] (million dollars)	New capital expenditures (million dollars)	All employees (1,000)	Value added by manufacture (million dollars)
	Phoenix SMSA	-	**1 978**	**488**	**84.6**	**1 136.2**	**61.1**	**99.4**	**677.2**	**2 999.6**	**2 999.6**	**4 686.6**	**186.5**	**71.8**	**1 379.9**
20	Food and kindred products	-	121	41	4.5	56.4	2.9	5.7	33.2	135.4	462.3	604.9	11.0	5.3	107.7
201	Meat products	-	22	10	1.1	14.6	0.8	1.6	10.7	21.1	217.0	244.8	1.8	(NA)	(NA)
2011	Meat packing plants	-	16	9	1.0	14.0	0.8	1.5	10.3	18.1	210.2	235.1	(D)	(NA)	(NA)
203	Preserved fruits and vegetables	E2	15	3	0.3	3.2	0.3	0.5	2.2	10.6	15.9	28.5	0.8	(NA)	(NA)
205	Bakery products	-	15	6	0.9	12.2	0.5	1.0	7.1	23.5	21.3	44.8	2.4	(NA)	(NA)
2051	Bread, cake, and related products	-	15	6	0.9	12.2	0.5	1.0	7.1	23.5	21.3	44.8	2.4	(NA)	(NA)
208	Beverages	-	12	6	0.5	6.7	0.2	0.5	2.3	23.6	32.3	56.9	(D)	0.7	15.4
23	Apparel and other textile products	-	71	19	3.4	21.9	3.1	5.4	17.1	53.6	44.5	97.9	(D)	3.3	29.7
239	Miscellaneous fabricated textile products	E1	45	6	0.6	4.2	0.5	0.9	3.1	9.4	9.6	18.5	(D)	(NA)	(NA)
2431	Millwork	-	19	5	0.4	4.2	0.3	0.6	3.0	8.2	17.9	25.9	0.3	0.5	6.9
2434	Wood kitchen cabinets	-	30	10	0.8	7.4	0.7	1.3	5.6	8.1	12.0	19.9	0.3	0.5	5.7
275	Commercial printing	E2	201	21	1.6	20.4	1.2	2.3	14.0	38.4	29.6	68.0	(D)	(NA)	(NA)
2782	Blankbooks and looseleaf binders	-	8	5	0.5	4.0	0.4	0.7	3.0	8.6	6.9	15.4	(D)	(NA)	(NA)
28	Chemicals and allied products	-	58	12	1.6	18.3	1.1	2.1	10.8	139.4	86.2	217.2	5.7	1.2	53.0
32	Stone, clay, and glass products	-	111	36	3.1	44.5	2.3	4.7	31.5	101.8	83.5	184.4	13.8	2.8	58.3
327	Concrete, gypsum, and plaster products	-	67	32	2.7	36.7	2.0	4.0	28.0	92.9	76.3	168.0	13.2	(NA)	(NA)
3272	Concrete products, n.e.c.	-	29	7	0.6	11.4	0.6	1.2	8.1	24.5	14.2	38.0	2.7	0.8	15.2
3273	Ready-mixed concrete	-	25	18	1.6	23.2	1.1	2.1	16.6	58.9	47.0	104.1	7.8	1.3	28.0
34	Fabricated metal products	E1	202	53	4.3	49.7	3.3	6.6	33.9	96.4	108.4	196.6	7.1	3.7	63.6
344	Fabricated structural metal products	E1	104	29	2.6	31.7	1.9	3.7	21.0	53.2	74.5	127.1	4.9	2.4	41.3
3443	Fabricated plate work (boiler shops)	E1	9	6	1.1	14.8	0.8	1.4	9.7	20.8	26.1	46.2	(D)	(NA)	(NA)
3444	Sheet metal work	E2	42	11	0.7	7.0	0.5	1.2	4.6	14.9	16.9	31.7	0.7	(NA)	(NA)
346	Metal forgings and stampings	E1	15	5	0.4	4.0	0.3	0.7	3.1	9.0	5.8	14.4	0.1	(NA)	(NA)
3469	Metal stampings, n.e.c.	E1	15	5	0.4	4.0	0.3	0.7	3.1	9.0	5.8	14.4	0.1	(NA)	(NA)
347	Metal services, n.e.c.	E1	27	6	0.4	3.7	0.4	0.7	2.7	7.2	3.1	10.3	0.7	(NA)	(NA)
349	Miscellaneous fabricated metal products	E2	36	6	0.4	4.2	0.3	0.6	2.8	6.0	10.0	17.6	0.4	(NA)	(NA)
35	Machinery, except electrical	-	304	69	12.2	181.3	7.1	14.2	78.8	691.1	184.9	888.3	(D)	9.1	266.6
36	Electric and electronic equipment	-	129	42	27.5	282.5	11.4	21.2	113.6	510.5	244.8	736.8	39.5	21.6	318.9
367	Electronic components and accessories	-	61	23	15.4	179.1	7.8	14.4	72.3	333.9	166.5	493.2	(D)	(NA)	(NA)
39	Miscellaneous manufacturing industries	E1	148	19	1.8	18.4	1.5	2.7	12.4	40.0	46.7	88.5	(D)	1.0	14.7
399	Miscellaneous manufactures	E2	74	10	0.7	7.1	0.6	1.0	4.5	14.1	9.9	23.8	(D)	(NA)	(NA)
3993	Signs and advertising displays	E1	28	7	0.3	3.6	0.2	0.4	2.3	6.0	4.1	10.0	(D)	(NA)	(NA)
--	Administrative and auxiliary	-	42	26	4.5	80.3	-	-	-	-	-	-	-	(NA)	(NA)
	Tucson SMSA	-	**486**	**77**	**11.1**	**143.6**	**6.8**	**13.8**	**72.3**	**302.7**	**233.6**	**604.9**	**17.8**	**8.1**	**155.7**
20	Food and kindred products	E1	26	9	0.8	7.6	0.3	0.8	3.4	21.2	37.8	58.8	1.3	0.9	14.8
23	Apparel and other textile products	E2	16	6	0.3	1.7	0.2	0.4	1.0	2.9	2.9	5.8	(D)	(NA)	(NA)
27	Printing and publishing	-	86	9	1.3	14.1	0.9	1.9	6.2	44.3	15.5	58.8	0.8	1.1	27.5
275	Commercial printing	E4	52	3	0.3	2.9	0.2	0.4	2.0	5.4	3.3	8.7	(D)	(NA)	(NA)
32	Stone, clay, and glass products	-	31	7	0.8	9.3	0.5	0.9	7.5	32.6	23.6	58.0	3.8	0.8	22.7
34	Fabricated metal products	E1	36	8	0.7	8.1	0.6	1.1	5.8	16.2	11.2	27.7	0.5	0.3	3.2
344	Fabricated structural metal products	E1	24	7	0.6	7.2	0.5	0.9	5.1	14.2	16.0	34.4	(D)	(NA)	(NA)
35	Machinery, except electrical	E1	33	3	0.5	5.8	0.3	0.6	2.6	12.6	6.5	19.1	1.5	(NA)	(NA)
367	Electronic components and accessories	-	8	5	0.9	9.5	0.7	1.4	5.1	20.1	9.3	29.4	(D)	(NA)	(NA)

Note: "All industries" level includes data on number of establishments, total employment, and total payroll for central administrative offices and auxiliaries (for definition, see appendix B).

- Represents zero. (D) Withheld to avoid disclosing operations of individual companies. (NA) Not available. (S) Withheld because estimate did not meet publication standards. (Z) Less than $50 thousand dollars or hours; under 50 employees.

[1]Payroll and sales data for small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the balance of items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 to 99 percent; E0—100 percent.

[2]Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B).

Table 7. Statistics by Selected Industry Group and Industry for Selected Counties: 1977 and 1972

[Includes counties with 450 employees or more and industry groups and industries with 450 employees or more within counties, except those that would disclose operations of individual companies. For explanation of terms, see appendix B]

SIC code	County and industry	1977												1972	
			All establishments		All employees		Production workers							All employees	
		E[1]	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[2] (million dollars)	Value of shipments[2] (million dollars)	New capital expenditures (million dollars)	All employees (1,000)	Value added by manufacture (million dollars)
	Cochise County	-	47	14	1.7	19.1	1.3	2.4	13.4	66.2	148.4	196.2	2.6	(D)	(D)
	Coconino County	-	70	14	1.8	20.2	1.3	2.6	13.9	63.3	73.9	134.1	4.1	1.6	34.5
	Maricopa County (Coextensive with Phoenix, Ariz., SMSA, see table 6)														
	Mohave County	-	66	11	1.7	21.0	1.3	2.4	13.0	34.1	34.3	66.0	(D)	0.8	14.6
	Navajo County	-	66	11	1.7	21.5	1.4	2.8	17.3	66.5	62.9	131.3	3.6	1.1	21.6
	Pima County (Coextensive with Tucson, Ariz., SMSA, see table 6)														
	Pinal County	-	56	10	2.5	33.1	2.0	4.0	23.6	66.1	464.0	536.2	2.3	2.3	134.1
	Yavapai County	-	70	12	1.6	16.4	1.2	2.3	11.3	53.9	37.1	90.6	1.7	1.1	30.6
	Yuma County	-	62	11	1.1	10.0	0.8	1.6	6.7	17.2	27.2	43.9	(D)	1.2	13.5
23	Apparel and other textile products	-	9	2	0.5	2.8	0.4	0.8	2.5	3.6	6.3	9.2	(D)	(NA)	(NA)

Note: "County" level includes data on number of establishments, total employment, and total payroll for central administrative offices and auxiliaries (for definition, see appendix B).

- Represents zero. (D) Withheld to avoid disclosing operations of individual companies. (NA) Not available. (Z) Less than 50 thousand dollars or hours, under 50 employees.

[1]Payroll and sales data for small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the balance of items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 to 99 percent; E0—100 percent.

[2]Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B).

Table 8. Statistics by Selected Industry Group and Industry for Selected Cities: 1977 and 1972

[Includes cities with 450 employees or more and industry groups and industries with 450 employees or more within cities, except those that would disclose operations of individual companies. For explanation of terms, see appendix B]

SIC code	City and industry	1977												1972	
			All establishments		All employees		Production workers							All employees	
		E[1]	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[2] (million dollars)	Value of shipments[2] (million dollars)	New capital expenditures (million dollars)	All employees (1,000)	Value added by manufacture (million dollars)
	Buckeye	-	6	3	0.5	3.5	0.4	0.7	2.6	6.6	7.7	14.3	(D)	(NA)	(NA)
	Chandler	-	36	15	1.6	18.1	1.3	2.5	11.5	66.3	66.5	144.6	5.7	(D)	(D)
	Douglas	-	30	10	1.3	13.6	1.0	1.8	8.7	46.3	116.0	164.6	1.4	(D)	(D)
	Flagstaff	-	66	11	1.3	16.0	1.0	1.6	8.3	42.7	66.0	101.7	(D)	1.0	16.7
	Glendale	-	66	19	3.3	39.6	1.6	3.1	12.6	61.6	67.6	169.6	1.6	2.6	35.3
-	Administrative and auxiliary	-	4	2	1.1	11.5	-	-	-	-	-	-	-	(NA)	(NA)

See footnotes at end of table.

Table 8. Statistics by Selected Industry Group and Industry for Selected Cities: 1977 and 1972—Con.

[Includes cities with 450 employees or more and industry groups and industries with 450 employees or more within cities, except those that would disclose operations of individual companies. For explanation of terms, see appendix B]

SIC code	City and industry	1977												1972	
			All establishments		All employees		Production workers								
		E[1]	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil.)	Wages (million dollars)	Value added by manufacture (million dollars)	Cost of materials[2] (million dollars)	Value of shipments[2] (million dollars)	New capital expenditures (million dollars)	All employees (1,000)	Value added by manufacture (million dollars)
	Mesa	-	**101**	**18**	**4.2**	**48.0**	**2.3**	**4.2**	**18.8**	**117.5**	**90.2**	**174.4**	**9.0**	**5.7**	**82.8**
	Phoenix	-	**1 284**	**332**	**58.2**	**814.7**	**36.1**	**69.2**	**423.6**	**1 923.4**	**1 479.8**	**3 334.2**	**111.5**	**52.2**	**1 083.7**
20	Food and kindred products	-	87	29	3.4	43.5	2.0	3.9	24.4	111.1	298.8	407.1	(D)	4.0	78.3
201	Meat products	-	18	6	0.8	10.2	0.6	1.1	7.6	24.1	120.4	143.6	(D)	(NA)	(NA)
2011	Meat packing plants	-	10	5	0.7	9.7	0.5	1.0	7.2	21.1	113.6	133.9	(D)	(NA)	(NA)
202	Dairy products	-	11	5	0.7	9.6	0.3	0.6	4.2	19.4	67.2	108.3	1.1	(NA)	(NA)
23	Apparel and other textile products	-	48	10	1.3	8.8	1.1	2.1	8.5	18.4	18.5	35.6	(D)	1.2	11.2
24	Lumber and wood products	-	59	20	1.4	13.9	1.1	2.1	10.2	24.3	38.1	61.7	(D)	1.7	18.7
243	Millwork, plywood, and structural members	-	41	15	1.0	11.4	0.9	1.7	9.5	19.3	29.6	48.3	0.6	(NA)	(NA)
27	Printing and publishing	E1	224	35	4.5	55.5	2.5	4.7	31.0	111.9	83.2	174.8	(D)	4.0	70.7
32	Stone, clay, and glass products	-	69	24	2.3	33.0	1.8	3.8	25.6	68.4	55.9	123.9	(D)	2.1	43.8
327	Concrete, gypsum, and plaster products	-	43	20	1.9	28.6	1.5	3.1	22.5	60.5	49.3	109.1	9.6	(NA)	(NA)
3272	Concrete products, n.e.c.	-	21	8	0.7	10.2	0.5	1.1	7.5	20.8	12.2	32.5	(D)	(NA)	(NA)
3273	Ready-mixed concrete	-	14	10	1.0	15.5	0.8	1.7	13.0	32.1	28.9	61.3	4.5	(NA)	(NA)
33	Primary metal industries	-	24	13	2.8	47.7	2.3	4.3	35.1	120.2	192.4	311.4	(D)	(NA)	(NA)
34	Fabricated metal products	E1	124	38	3.2	36.1	2.4	4.9	24.9	61.4	73.5	134.0	(D)	2.4	37.1
344	Fabricated structural metal products	-	65	22	2.0	25.4	1.5	3.0	17.2	40.1	60.0	99.8	4.2	(NA)	(NA)
3444	Sheet metal work	E	28	9	0.8	5.8	0.5	1.1	4.0	12.8	13.3	25.9	0.6	(NA)	(NA)
36	Electric and electronic equipment	-	71	24	11.9	138.0	8.2	11.5	58.7	211.7	140.8	348.3	(D)	12.3	158.0
367	Electronic components and accessories	-	31	14	10.6	124.8	5.1	9.4	47.4	187.1	121.9	301.6	(D)	(NA)	(NA)
39	Miscellaneous manufacturing industries	E2	90	15	1.1	11.8	0.8	1.8	7.0	23.2	18.8	41.5	(D)	0.8	13.4
399	Miscellaneous manufactures	E2	55	10	0.8	8.5	0.5	0.9	4.1	12.7	9.0	21.8	(D)	(NA)	(NA)
--	Administrative and auxiliary	-	27	18	2.7	53.6	-	-	-	-	-	-	-	(NA)	(NA)
	Prescott	-	**31**	**8**	**1.1**	**16.8**	**0.8**	**1.5**	**8.8**	**23.3**	**20.5**	**42.8**	**8.4**	**0.8**	**8.2**
	Scottsdale	-	**113**	**16**	**5.8**	**77.9**	**2.3**	**4.3**	**23.9**	**135.4**	**52.8**	**172.1**	**6.9**	**3.4**	**66.9**
36	Electric and electronic equipment	-	18	8	4.9	70.6	1.9	3.6	21.1	113.8	44.8	152.8	(D)	(NA)	(NA)
	Tempe	-	**201**	**47**	**4.5**	**51.7**	**3.2**	**6.3**	**30.8**	**108.8**	**98.1**	**191.8**	**8.2**	**2.7**	**37.9**
23	Apparel and other textile products	-	7	4	0.5	3.4	0.5	0.8	2.9	4.9	3.3	8.1	(D)	(NA)	(NA)
35	Machinery, except electrical	E2	49	11	0.8	8.3	0.4	0.9	5.4	18.1	7.9	23.9	(D)	(NA)	(NA)
36	Electric and electronic equipment	-	22	4	0.8	10.0	0.8	1.1	6.2	24.6	9.9	33.7	(D)	(NA)	(NA)
	Tucson	-	**393**	**87**	**9.8**	**126.8**	**6.8**	**10.7**	**69.9**	**287.1**	**237.4**	**588.8**	**13.7**	**7.8**	**126.8**
27	Printing and publishing	-	74	8	1.2	13.0	0.5	0.9	5.7	42.3	14.5	56.9	0.7	1.1	27.2
34	Fabricated metal products	E1	26	7	0.8	7.4	0.5	1.0	5.3	14.8	10.1	25.1	0.5	(NA)	(NA)
344	Fabricated structural metal products	E1	19	7	0.8	6.9	0.5	0.9	5.0	13.9	9.7	23.8	0.4	(NA)	(NA)
35	Machinery, except electrical	E1	27	3	0.5	5.5	0.3	0.5	2.4	12.1	6.2	18.4	1.5	(NA)	(NA)
36	Electric and electronic equipment	-	14	5	1.0	11.0	0.7	1.5	8.2	34.0	12.2	36.8	(D)	0.7	8.4
	Yuma	-	**46**	**9**	**0.9**	**8.9**	**0.8**	**1.5**	**8.1**	**14.8**	**20.7**	**37.8**	**(D)**	**1.1**	**11.8**

Note: "City" level includes data on number of establishments, total employment, and total payroll for central administrative offices and auxiliaries (for definition, see appendix B).
- Represents zero. (D) Withheld to avoid disclosing operations of individual companies. (NA) Not available. (Z) Less than 50 thousand dollars or hours; under 50 employees.
[1] Payroll and sales data for small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the balance of items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those industry groups and industries where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 to 99 percent; E0—100 percent.
[2] Aggregate of cost of materials and value of shipments for industry groups (2- and 3-digit) and for all manufacturing industries includes extensive duplication, since products of some industries are used as materials by others (see appendix B).

Table 9. Distribution of Establishments by Employment Size and Major Industry Group for the State and Counties: 1977

(Major groups descriptions are: 20--food and kindred products; 21--tobacco manufactures; 22--textile mill products; 23--apparel and other textile products; 24--lumber and wood products, 25--furniture and fixtures; 26--paper and allied products; 27--printing and publishing; 28--chemicals and allied products; 29--petroleum and coal products; 30--rubber and miscellaneous plastics products; 31--leather and leather products; 32--stone, clay, and glass products; 33--primary metal industries; 34--fabricated metal products; 35--machinery, except electrical; 36--electric and electronic equipment; 37--transportation equipment; 38--instruments and related products; 39--miscellaneous manufacturing industries. For explanation of terms, see appendix B)

State, county, and employee size class[1]	All establishments	Establishments in major industry groups																				
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	CAO's
ARIZONA	2892	190	-	7	117	211	103	29	476	82	14	103	27	204	64	261	380	159	100	78	219	62
1 TO 4 EMPLOYEES	1444	90	-	3	67	113	46	13	206	43	8	50	16	92	20	123	190	61	53	45	136	9
5 TO 9 EMPLOYEES	397	17	-	1	12	17	15	3	67	13	-	24	3	33	7	33	62	29	15	12	26	8
10 TO 19 EMPLOYEES	374	23	-	1	19	21	21	3	59	9	3	10	2	28	1	43	51	19	9	8	31	13
20 TO 49 EMPLOYEES	353	27	-	1	11	24	20	5	43	10	2	9	2	27	13	39	51	18	14	4	18	15
50 TO 99 EMPLOYEES	152	24	-	1	8	19	-	3	13	2	1	5	2	14	7	13	12	11	2	5	4	6
100 TO 249 EMPLOYEES	113	10	-	-	15	15	1	1	8	4	-	5	2	10	4	7	6	10	4	2	3	6
250 TO 499 EMPLOYEES	31	3	-	-	4	2	-	-	-	-	-	-	-	-	7	3	2	4	1	1	1	3
500 TO 999 EMPLOYEES	15	-	-	-	1	-	-	1	1	1	-	-	-	-	4	-	3	3	-	-	-	1
1000 TO 2499 EMPLOYEES	6	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	2	1	-	-	-	1
2500 EMPLOYEES AND OVER	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	2	1	-	-
APACHE COUNTY	21	-	-	-	-	12	-	-	2	2	-	-	1	2	-	-	-	-	1	-	1	-
1 TO 19 EMPLOYEES	16	-	-	-	-	8	-	-	2	2	-	-	1	2	-	-	-	-	-	-	1	-
20 TO 99 EMPLOYEES	4	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
100 TO 249 EMPLOYEES	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COCHISE COUNTY	47	7	-	-	6	-	-	-	12	2	-	1	1	9	1	1	3	3	-	1	-	2
1 TO 19 EMPLOYEES	33	6	-	-	-	-	-	-	10	1	-	1	1	8	-	1	2	3	-	-	-	2
20 TO 99 EMPLOYEES	10	1	-	-	2	-	-	-	2	1	-	-	-	1	-	-	1	-	-	1	-	-
100 TO 249 EMPLOYEES	3	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250 EMPLOYEES AND OVER	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
COCONINO COUNTY	70	8	-	-	2	21	2	1	7	-	2	-	-	5	1	8	6	1	2	1	4	1
1 TO 19 EMPLOYEES	54	6	-	-	1	16	2	-	6	-	1	-	-	4	-	8	4	1	2	1	3	1
20 TO 99 EMPLOYEES	9	1	-	-	1	3	-	1	1	-	1	-	-	1	-	-	-	-	-	-	1	-
100 TO 249 EMPLOYEES	4	1	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
250 EMPLOYEES AND OVER	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GILA COUNTY	26	1	-	-	-	9	-	-	3	3	-	-	-	5	4	1	2	-	-	-	2	-
1 TO 19 EMPLOYEES	17	1	-	-	-	2	-	-	3	2	-	-	-	5	-	1	2	-	-	-	1	-
20 TO 99 EMPLOYEES	6	-	-	-	-	3	-	-	-	1	-	-	-	-	1	-	-	-	-	-	1	-
250 EMPLOYEES AND OVER	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
GRAHAM COUNTY	13	8	-	1	-	-	-	-	3	1	-	-	-	1	-	-	-	1	-	-	-	-
1 TO 19 EMPLOYEES	10	6	-	1	-	-	-	-	2	1	-	-	-	1	-	-	-	1	-	-	-	-
20 TO 99 EMPLOYEES	3	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
GREENLEE COUNTY	5	2	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-
1 TO 19 EMPLOYEES	4	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
250 EMPLOYEES AND OVER	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
MARICOPA COUNTY	1976	121	-	5	71	91	70	20	321	58	8	80	15	111	43	202	304	128	79	50	148	42
1 TO 19 EMPLOYEES	1488	80	-	3	52	57	42	14	272	46	7	67	14	75	22	149	235	86	61	41	129	16
20 TO 99 EMPLOYEES	344	29	-	2	9	22	16	5	41	9	1	11	-	28	15	44	54	25	13	5	10	17
100 TO 249 EMPLOYEES	82	9	-	-	6	12	1	1	7	2	-	2	1	8	2	7	5	8	3	2	2	4
250 EMPLOYEES AND OVER	40	3	-	-	4	-	-	-	1	1	-	-	-	-	4	2	6	9	2	2	1	5
MOHAVE COUNTY	68	4	-	1	6	6	3	1	10	-	-	2	-	10	1	4	7	-	4	-	8	1
1 TO 19 EMPLOYEES	57	4	-	1	4	6	2	-	9	-	-	2	-	8	-	4	6	-	3	-	8	-
20 TO 99 EMPLOYEES	9	-	-	-	2	-	1	1	1	-	-	-	-	2	1	-	-	-	1	-	-	-
100 TO 249 EMPLOYEES	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
250 EMPLOYEES AND OVER	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
NAVAJO COUNTY	58	4	-	-	-	29	1	1	4	1	-	-	-	6	-	1	3	-	-	-	1	1
1 TO 19 EMPLOYEES	47	3	-	-	-	21	1	-	4	-	-	-	-	6	-	1	3	-	-	-	1	1
20 TO 99 EMPLOYEES	6	1	-	-	-	6	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
100 TO 249 EMPLOYEES	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250 EMPLOYEES AND OVER	2	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIMA COUNTY	406	26	-	-	18	23	12	1	85	11	3	14	9	31	4	35	33	21	11	21	42	8
1 TO 19 EMPLOYEES	329	17	-	-	10	19	11	1	76	10	3	10	4	24	1	27	30	14	8	20	39	5
20 TO 99 EMPLOYEES	62	9	-	-	6	4	1	-	7	1	-	2	4	6	2	7	2	4	1	1	3	2
100 TO 249 EMPLOYEES	10	-	-	-	-	-	-	-	1	-	-	2	1	1	1	-	1	2	1	-	-	1
250 EMPLOYEES AND OVER	5	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	1	1	-	-	-
PINAL COUNTY	55	6	-	-	5	5	3	-	5	1	-	2	-	4	6	4	9	1	1	-	1	2
1 TO 19 EMPLOYEES	37	3	-	-	2	4	1	-	4	-	-	1	-	3	5	4	8	1	1	-	1	1
20 TO 99 EMPLOYEES	10	3	-	-	-	1	2	-	1	-	-	-	-	1	-	-	1	-	-	-	-	1
100 TO 249 EMPLOYEES	5	-	-	-	3	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-
250 EMPLOYEES AND OVER	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-

See footnotes at end of table

Table 9. Distribution of Establishments by Employment Size and Major Industry Group for the State and Counties: 1977—Con.

(Major groups descriptions are: 20--food and kindred products; 21--tobacco manufactures; 22--textile mill products; 23--apparel and other textile products; 24--lumber and wood products, 25--furniture and fixtures; 26--paper and allied products; 27--printing and publishing; 28--chemicals and allied products; 29--petroleum and coal products; 30--rubber and miscellaneous plastics products; 31--leather and leather products; 32--stone, clay, and glass products; 33--primary metal industries; 34--fabricated metal products; 35--machinery, except electrical; 36--electric and electronic equipment; 37--transportation equipment; 38--instruments and related products; 39--miscellaneous manufacturing industries. For explanation of terms, see appendix B)

State, county, and employment size class[1]	All establishments	Establishments in major industry groups																			
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	CMO's
SANTA CRUZ COUNTY	15	1	-	-	1	-	1	1	6	-	-	1	-	-	-	1	-	-	-	-	2	3
1 TO 19 EMPLOYEES	12	1	-	-	1	-	1	1	6	-	-	1	-	-	-	1	-	-	-	-	1	1
20 TO 99 EMPLOYEES	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
100 TO 249 EMPLOYEES	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YAVAPAI COUNTY	70	-	-	-	3	15	1	-	14	-	-	2	1	14	3	1	5	4	1	4	2	-
1 TO 19 EMPLOYEES	58	-	-	-	1	14	1	-	13	-	-	1	1	11	2	1	4	3	1	3	2	-
20 TO 99 EMPLOYEES	7	-	-	-	-	1	-	-	1	-	-	1	-	2	1	-	-	-	-	1	-	-
100 TO 249 EMPLOYEES	4	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	1	1	-	-	-	-
250 EMPLOYEES AND OVER	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YUMA COUNTY	62	8	-	-	9	6	1	6	6	3	1	1	-	6	-	3	10	-	1	1	3	2
1 TO 19 EMPLOYEES	51	5	-	-	7	6	1	3	5	3	-	1	-	6	-	2	9	-	1	-	2	2
20 TO 99 EMPLOYEES	9	3	-	-	-	-	-	1	1	-	1	-	-	-	-	1	1	-	-	1	-	-
100 TO 249 EMPLOYEES	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250 EMPLOYEES AND OVER	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Data on number of establishments by employment size class by 4-digit SIC industry for States, counties, and selected cities are presented in Location of Manufacturing Plants data series. This series is available only on computer tape (see introduction).

- Represents zero.

[1]Only those counties and size classes that include data for manufacturing establishments are shown.

APPENDIX A. Standard Metropolitan Statistical Areas

(Titles and definitions of the SMSA's in the State established by the Department of Commerce, Office of Federal Statistical Policy and Standards, as of December 1977)

PHOENIX SMSA

Coextensive with Maricopa County, Ariz.

TUCSON SMSA

Coextensive with Pima County, Ariz.

APPENDIX B. Explanation of Terms

This appendix is in two sections. Section 1 includes items for which all establishments that were mailed census of manufactures forms were requested to supply information. Section 2 covers supplementary items for which only establishments included in the annual survey of manufactures (ASM) sample were requested to supply information. Results of the supplementary ASM inquiries are included in table 3b of this report. (See the Introduction, Manufacturing Universe and Census Report Forms, for a detailed explanation of the use of the ASM sample in a census of manufactures year and a description of the various report forms.)

SECTION 1. ITEMS COLLECTED ON ALL CENSUS OF MANUFACTURES REPORT FORMS

Employment and related items—The regular report forms requested separate information on production workers as of a payroll period for each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period ending nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the mid-month payroll periods of March, May, August, and November.

Production workers—This category includes workers (up through the working foreman level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and watchman services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Supervisory employees above the working foreman level are excluded from this category.

All other employees—This item covers nonproduction personnel of the manufacturing establishment, including those engaged in factory supervision above the working foreman level, sales (including driver salesmen), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office functions, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical. Also included are employees on the payroll of the manufacturing establishment who are engaged in the construction of major additions or alterations to the plant and who are utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls was also requested of central administrative offices or auxiliary units (e.g., warehouses and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the Summary and Geographic Area reports and in the final bound volumes as a separate category.

Central Administrative Office and Auxiliary Unit Employees—As noted in the Introduction, companies were asked to file a special report form for any central administrative office that was at a different location than the establishments managed or served, or at the same location as one of the establishments but not operated as an intergral part of the establishment. Employees in **central administrative offices** are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting, tax accounting, company sales and profits reports, and personnel accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters. **Auxiliaries** are separate storage facilities, garages, repair shops, purchasing offices, sales promotion offices, research and development organizations, etc., serving the plants or central management of the company.

The employment and payrolls of the central administrative offices and auxiliaries serving manufacturing establishments are included in all tables at the "all industries" level. In tables where industry detail is shown, the data for these units appear as a separate industry group.

Payrolls—This item includes the gross earnings paid in the calendar year 1977 to all employees on the payroll of operating manufacturing establishments. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations, but excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Federal Statistical Policy and Standards. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained below.)

As in the case of employment figures, the payrolls of separate central administrative offices and auxiliary units of multiestablishment companies are included in all tables at the "all industries" level. In tables where industry detail is shown, the data for these units appear as a separate industry group.

Production worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of materials—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, regardless of whether what was consumed was purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (2) electric energy purchased; (3) fuels consumed for heat, power, or generating electricity; (4) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Value of shipments—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, i.e., including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Duplication in cost of materials and value of shipments—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication, since the products of some industries are used as materials by others. With some important exceptions, such as for motor vehicles and parts, this duplication is not significant at the 4-digit industry level. However, it is significant at the 2-digit and 3-digit industry group level because these totals often include industries which represent successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the "Food" group and the addition of pulp mills to paper mills in the "Paper and Allied Products" group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication—the value of finished manufactures—tends to approximate two-thirds of the total value of products reported in the census of manufactures.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is then adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process inventories between the beginning and end of the year.

"Value added" avoids the duplication in the figure for value of shipments which results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures—For establishments in operation and establishments under construction but not yet in

operation, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures exclude that portion of expenditures leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers were also requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred to the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; i.e., it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form and is subject to sampling error (see table 3b).

The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in both tables 3a and 3b. The figure in table 3a is a census universe total and may differ from the results of the ASM sample shown in table 3b. Since the figures in table 3b are subject to sampling error, they are not considered as reliable as the universe figures.

End-of-year inventories—Respondents were asked to report their 1977 and 1976 end-of-year inventories at approximate current costs if feasible, otherwise at book values. Since different methods of inventory valuation are used (LIFO, FIFO, etc.), the definition of the value of inventories aggregate for all establishments in an industry is not precise. The change in inventory between years is of considerably greater significance.

In using inventory data by stage of fabrication for "all industries" and at the 2-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing" which are aggregates of figures reported by establishments in specified industries.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORM

Cost of purchased services—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of building and machinery are payments made for all maintenance and repair work on buildings and equipment such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property are also included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract and incurred directly by an establishment in using its own work force are also excluded.

The response coverage ratio shown in table 3b for each of the three types of purchased services listed above is a measure of the extent to which respondents reported for each item. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight; see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

Rental payments—This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets were to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company, and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

Supplemental labor costs—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment com-

pensation, and workmen's compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost is generally similar to the items covered in the annual survey labor costs statistics, accounting records do not generally provide reliable figures on net employee benefits of these types.

Beginning and end-of-year depreciable assets—The data encompass all fixed depreciable assets on the books of establishments at the beginning and at the end of the year. The values shown represents the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets such as patent rights and royalties. Also excluded are land and depletable assets such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equaled assets at the end of the year.

New and used capital expenditures—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)

Breakdown of new capital expenditures for machinery and equipment—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use which were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways—vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects—are excluded from this item.

The "not specified by kind" or n.s.k. item for expenditures for new machinery and buildings shown in table 3b represents the total machinery and equipment expenditures for establishments that did not break down their expenditures for the three specific categories. This means that for most industries the specific categories are understated.

Retirements—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1977. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent was also requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

Depreciation charges—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.

APPENDIX C. Annual Survey of Manufactures

DESCRIPTION OF SURVEY SAMPLE

The annual survey of manufactures (ASM) is a survey based on a probability sample of about 70,000 manufacturing establishments selected from the census of manufactures universe. The current sample was selected from the manufacturing establishments included in the 1972 Census of Manufactures supplemented by Social Security Administration (SSA) files of manufacturers that opened after 1972. As in the earlier surveys, companies rather than establishments were defined as the sampling units. The selected companies were required to report for all of their plants, so that new establishments of existing companies also were represented in the sample.

All companies that had any manufacturing establishments with 250 employees or more in the 1972 census were included in the survey sample. These large companies, included with certainty, collectively account for more than two thirds of total manufacturing employment.

Smaller companies were selected for the ASM in accordance with mathematical theory for optimum allocation of a sample. Their probabilities of inclusion ranged from 1.000 to 0.005 and were proportional to measures of size determined for each company. The measures of size of companies included in the 1972 Census of Manufactures depended directly upon each company's 1972 product class values and the historic variability of the year-to-year shipments of each product class. Roughly equivalent measures of size were assigned to the postcensus companies based on their industry codes and anticipated employment. (More specific information was not available for them in the SSA files used for sampling.)

To improve the reliability of the industry statistics for geographic areas, two features were incorporated into the sample design. First, some weight was given to the total value of shipments of each establishment relative to the total value of shipments for the State in which the establishment was located. Second, product class values for establishments in those States in which the total level of manufacturing was relatively low or was rapidly expanding (but for which the reliability of estimates was not expected to be much improved by the first sample design feature) were multiplied by factors ranging from 1.15 to 1.25 before measures of size were developed.

This method of assigning measures of size was used to maximize the precision (i.e., minimize the variance) of estimates of the year-to-year change in the value of product class shipments. Implicitly, it also gave weight to differences in employment, value added, and other industry statistics. These items are highly correlated with total value of shipments, and the assigned size measures varied directly with that total for each company.

The cost of collecting and processing data for a company is roughly proportional to the number of its establishment reports. To maximize the sample information obtained for a fixed total cost, each company's initial size measure was divided by the square root of its number of establishments. Sample selection probabilities then were obtained by multiplying each company's final measure of size by an overall sampling fraction calculated to yield the total expected sample size.

The sample selection procedure gave each company in the sampling frame an independent chance of selection. This method of selection differs from the method of systematic selection used in annual surveys prior to 1959. (With systematic selection, only certain combinations of companies can fall into the sample depending on the order in which they are arrayed at the time the sample is drawn.) Independent selection permits the rotation of the smaller companies into and out of a given sample panel without introducing a bias into the survey estimates.

ESTIMATING PROCEDURES

Most of the historical data compiled from the annual survey of manufactures sample were computed by the "difference estimate formula." For each item, linear estimates of the totals for both the most recent census of manufactures year and the ASM year were developed by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values to publication levels. Then the difference between the two linear estimates was added to the complete (universe) total for the census year to produce the estimate for the ASM year. Estimates developed by the difference estimate formula usually are far more reliable than the comparable linear estimates developed from the current sample data alone.

The 1977 data shown in table 3b of this report were also developed using difference estimates. However, since the universe totals for the census year (either 1972 or 1977) were not known for any of the table 3b items, except for selected expenditure statistics, a modification of the procedure described above was necessary. For each item in table 3b, except purchased services and the breakdown of expenditures for new machinery and equipment (see further description in appendix A), linear estimates of the publication totals from the ASM sample were adjusted by the difference between imputed census totals and the corresponding ASM sample estimates of these imputed totals. These imputed totals are obtained by applying industry average ratios to control item values at the establishment level. For example, an imputed total beginning assets figure is obtained by multiplying each establishment's total value of shipments by the industry (4-digit SIC) average for the ratio of beginning assets to shipments.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The sampling errors—the differences between the estimates obtained and the results theoretically obtainable from a comparable complete coverage survey—are unknown. Guides to the potential size of the sampling errors, however, are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete coverage values.

Estimates of the standard errors have been computed from the sample data for the current statistics in table 3b, as well as the historical ASM data in tables 2a, and 2b. They are presented in the form of relative standard errors, i.e., the standard errors divided by the estimated values to which they refer.

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals—ranges that would include the comparable complete coverage value for specified percentages of all the possible samples. The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all possible samples.

An inference that the comparable complete survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence with which the estimates from a particular sample would differ from complete coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, i.e., a standard error of 1,000 (2 percent of 50,000). Then there is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete coverage total, and almost certain confidence that the interval 47,000 to 53,000 includes the complete coverage total.

In addition to the sample errors, the estimates are subject to various operational errors (errors of collection, reporting, coding, transcription, imputation for nonresponse, etc.). These errors would also occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. When they were detected too late to correct, the data were suppressed or were specifically qualified in the tables. The small operational errors usually remain; to some extent they are compensating in the aggregated totals shown.

As derived, the estimated standard errors include part of the effect of the operational errors. The total error, which depends upon the joint effect of the sampling and operation errors, is usually of the order of size indicated by the standard error or only moderately higher. For particular estimates, however, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the annual surveys of manufactures is not identical to the complete coverage of the censuses of manufactures as conducted. Nearly all types of operational errors that affect the surveys also occur in the censuses. The surveys and the censuses, however, are conducted under quite different conditions, and operational errors can be controlled more tightly in the surveys than in the censuses. As a result, errors in many of the census figures are of the same order of size as the total errors in the corresponding annual survey estimates. The differences between the census and the survey operating conditions also disturb, to some degree, the comparability of the census and annual survey data.

Any figure shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with other totals, creating a broader aggregate which may then be of acceptable reliability.

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PUBLICATION PROGRAM

1977 CENSUS OF MANUFACTURES

Publications of the 1977 Census of Manufactures, containing final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233.

Preliminary area data from the 1977 census were issued in separate reports for each State, and industry data in 444 separate reports covering 452 industries or combinations of industries. Final detailed statistics are issued in separate paperbound reports. These reports subsequently are assembled and reissued in clothbound volumes.

Final Reports

Industry series—82 reports (MC77-I-20A to -39D)

Each of the 82 reports provides information for a group of related industries (e.g., "dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 452 manufacturing industries on quantity and value of products shipped and materials consumed; cost of fuels and electric energy; capital expenditures; assets; rents; inventories; employment; payrolls; payroll supplements; hours worked; value added by manufacturing; number of establishments; and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacturing, capital expenditures, employment, and payrolls are shown by employment size class of establishment and degree of primary product specialization. Statistics are given on production of specific products and consumption of energy and various materials by industry.

Geographic Area series—51 reports (MC77-A-1 to -51)

A separate report for each State and the District of Columbia presents data for industry groups and industries on value of shipments, value added by manufacturing, employment, payrolls, hours worked, new capital expenditures, and number of manufacturing establishments. Comparative statistics for earlier years and similar totals for all manufacturing industries are also shown for SMSA's, counties, and cities with significant manufacturing activity. Data are shown by industry groups and industries for SMSA's and larger counties and cities. Detailed statistics—including inventories, assets, rents, and cost of materials and energy—are presented only in statewide totals.

Subject series—16 reports (MC77-SR-1 to -16)

Each of the 16 reports contains detailed statistics for an individual subject, such as size of establishments; manufacturers' inventories; capital expenditures; fixed assets; and rental payments; selected materials consumed; selected metal working operations; manufacturing activity in government establishments; concentration ratios in manufacturing; type of organization; water use in manufacturing; fuels and electric energy consumed; textile machinery in place; origin of exports for manufacturing establishments; analytical ratios for manufacturing industries; distribution of sales by class of customer; production indexes; and a general National level summary.

Final Report Volumes

- Volume I. Summary and Subject Statistics—data previously issued in series MC77-SR
- Volume II. Industry Statistics—data previously issued in series MC77-I

  Part 1. Major Groups 20 to 26
  Part 2. Major Groups 27 to 34
  Part 3. Major Groups 35 to 39

- Volume III. Geographic Area Statistics—data previously issued in series MC77-A

  Part 1. Alabama to Montana
  Part 2. Nebraska to Wyoming

Microfiche

All published data are also available on microfiche. (See page VIII.)

Computer Tapes

Public-use computer tapes contain most of the summary data that are found in the published reports. In addition to the published data being on computer tape, one major data series, the location of manufacturing plants, will be available only on computer tape. Public-use computer tapes are available for users who wish to summarize, rearrange, or process large amounts of data. (See page VIII.)

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, enterprise statistics, minority-owned businesses, women-owned businesses, and transportation also are issued as part of the 1977 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, and Guam. Separate announcements describing these reports are available free of charge from Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233.